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THESIS

CROSS-SECTOR COLLABORATION AMONG CRITICAL INFRASTRUCTURE UTILITIES: A CASE STUDY FOR ASSESSING RELATIONAL CAPACITY

by

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September 2007

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CROSS-SECTOR COLLABORATION AMONG CRITICAL INFRASTRUCTURE UTILITIES: A CASE STUDY FOR ASSESSING RELATIONAL CAPACITY

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ABSTRACT

This nation relies on the network of critical infrastructures to maintain economic superiority, public health, and military strength. Under this premise, the federal government established the *National Infrastructure Protection Plan* (NIPP) to leverage national and regional preparedness. Hurricane Katrina demonstrated that, collectively, the infrastructure sectors are not prepared to respond to local and regional disasters using national strategies and resources. There remains a lack of capability to assess an organization's capacity to collaborate. To better understand the enablers and barriers to collaboration within a region's infrastructure system, this study reports the findings of interviews of 13 middle managers and 10 top managers from the utility organizations in and around Mesa, Arizona. In addition to interviews, the managers in this case study completed a survey on collaborative capacity, which provides a lens for examining the factors that enable and impede cross-sector collaboration in the City of Mesa and the interdependent sectors. Finally, the managers were requested to provide individual interpretations of the survey data and recommendations for improvement on the "Response Form." Incorporating this feedback will be critical for starting the momentum for change.

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I.   INTRODUCTION

The disparate sectors cannot prepare for every eventuality; thus, only through a collective approach can we build effective capabilities and achieve the greatest return on our national investment in homeland security.[1]

A.   PROBLEM STATEMENT

The United States federal government identifies infrastructure (i.e., water, electricity, gas, and transportation) as critical to our nation's prosperity. Every community's economic development, quality of life, and public safety depend on this service network. Following the events of 9/11, the nation's infrastructure was thrust into a new dimension of responsibilities. As a result of this disaster, it became increasingly clear that, collectively, the infrastructure sectors were not prepared to respond to local and regional disasters using existing national strategies and resources. In 2004, findings of an Interdependencies Tabletop Exercise in New Orleans, Louisiana, confirmed deficiencies in cross-agency relationships:

> The infrastructures for the most part focused on their own organizational interests, with minimal cross-sectoral coordination or formalized relationships. Organizations seriously overestimated their capabilities to protect against threats and attacks and respond and recover expeditiously. Overall, the lack of clarity on roles and responsibilities, coupled with the lack of coordination and communication together pose serious obstacles to effective response and recovery from disruptions.[2]

In 2006, the Department of Homeland Security developed the National Infrastructure Protection Plan (NIPP) that identified several key strategies for improving

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[1] Department of Homeland Security, *State and Urban Area Homeland Security Strategy: Guidance on Aligning Strategies with the National Preparedness Goal* (Washington, DC: Department of Homeland Security, July 2005): 2. http://www.ojp.usdoj.gov/odp/docs/StrategyGuidance_22JUL2005.pdf [Accessed August 18, 2006].

[2] Gulf Coast Regional Partnership for Infrastructure Security, *Purple Crescent II: Exercise Report Executive Summary* (New Orleans, LA: Office of Homeland Security, October 2004): 3-5. http://www.pnwer.org/portal/DocumentLibrary/tabid/53/DMXModule/369/Command/Core_Download/Default.aspx?EntryId=254 [Accessed September 6, 2006].

disaster preparedness, prevention, and response. Recognizing the interdependencies among the agencies, the plan stresses the need to improve coordination and collaboration among infrastructure agencies.[3]

While collaboration is important across all infrastructure agencies, this thesis will focus on preparedness issues between the water sector and critical interdependent sectors.[4] Despite being physically networked, the infrastructure sectors remain substantially "stove-piped" and autonomous in their planning efforts. Using the water sector as a focus point, emergency planning, exercises and hardening of assets are accomplished in isolation or with ad hoc coordination of committees, disregarding redundancies and cost-benefit implications to the community, region, or nation.[5] Despite the water sector's importance to homeland security preparedness, there is concern that the water sector does not adequately recognize its roles and responsibilities in respect to the National Incident Management System (NIMS). Retired Mesa Fire Chief Dennis Compton touched on this issue during a recent Continuity of Operations Conference in Mesa, Arizona. He stated,

> Katrina was a landmark day. In all, 60% of the response and recovery duties were not directly related to public safety, they related to public works. All participants need to learn how to play; it is not a public safety show."[6] "In the case of Homeland Security, a capacity for interagency collaboration is critical both for efficiently conducting routine tasks and for innovatively responding and improvising in the face of terrorist threats or natural disasters."[7] The response to a disaster will likely be chaotic, in

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[3] Department of Homeland Security, *National Infrastructure Protection Plan* (Washington, DC: Department of Homeland Security, 2006), http://www.dhs.gov/xlibrary/assets/NIPP_Plan.pdf [Accessed October 15, 2006].

[4] Water Environment Federation (WEF), *Summary Report on Water Sector Security Workshops* (Washington, DC: Environmental Protection Agency, 600/R-06/070, June 2006): 7.

[5] National Drinking Water Advisory Council, *Water Security Practices, Incentives, and Measures* (Washington, DC: Environmental Protection Agency, June 2005): 15-16. http://www.epa.gov/safewater/ndwac/pdfs/wswg/wswg_report_final_july2005.pdf [Accessed August 29, 2006].

[6] Dennis Compton (Former Fire Chief, Presentation at the Fire Training Center, Mesa, Arizona) November 6, 2006.

[7] Susan Hocevar, Gail Thomas, and Erik Jansen, *Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness* (Monterey, CA: Naval Postgraduate School, 2004): 5.

and of itself; collectively preparing to respond with other agencies would increase the ability to recover from such disasters.

In this case, the City of Mesa does not outwardly exhibit cross-sectoral interactions. For example, Mesa's city manager recently chaired a meeting to discuss the lapse of cross-sectoral information sharing during a locally heavy thunderstorm.[8] The electric provider (Salt River Project) had lost service to the eastern portions of the city, which affected the production of drinking water at the city-owned treatment facility. In addition, there was localized flooding, streets were closed, and traffic controls were lost. Assessing the scenario, the respective departments did not communicate or collectively integrate responses. In essence, no one knew what the other was doing or needed. Realizing the need to ensure reliable services to our customers and maintain situational awareness, the city manager directed executive leadership to incorporate collaboration and coordination across the city.[9] This event occurred in August of 2006; the trickle-down effects of this mandate are yet to be observed.

The water sector needs to interact with dependent sectors to achieve greater resiliency.

> In fact, the extent to which business and industry are able to assist each others' infrastructure protection policies is likely to prove one of the most central determinants of whether or not critical infrastructure protection efforts are succeeding.[10]

Collaboration limited to agencies within a specific infrastructure sector will not guarantee resiliency of the network of sectors.[11] The primary risk that threatens to undermine the reliability and security of this nation's essential services is the inadequacy

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[8] Mesa's City Manager, in discussion with the author during the "Emergency Storm Planning" meeting, Mesa, Arizona, August 31, 2006.

[9] Christopher Brady, Manager's Message to all city personnel, November 3, 2006.

[10] Michael Scardaville, "An Assessment of Federal Critical Infrastructure Protection Efforts Since September 11th" (Arlington, VA: Lexington Institute, n.d.): 1. http://www.hsdl.org/homesec/docs/nonprof/nps08-091604-41.pdf [Accessed April 28, 2007].

[11] Homeland Security Advisory Council, *Report of The Critical Infrastructure Task Force* (Washington, DC: Department of Homeland Security, January 2006): 12. http://www.dhs.gov/xlibrary/assets/HSAC_CITF_Report_v2.pdf [Accessed August 26, 2006].

of cooperative mechanisms within the homeland security community. This creates a significant vulnerability that could be exploited to bring about catastrophic structural and organizational failures. Therefore, work done in advance of possible failures and disasters is an essential aspect of preparedness.[12]

This is especially problematic for the water sector, because so many dependent relationships are not easily understood.[13] Characteristically, local government agencies, such as Mesa's water utility, represent stable organizations that prefer to protect the status quo rather than change.[14] The infrastructure sectors will not, and should not, prepare alone.[15] They must work within the larger response communities and with other sectors to support homeland security. The realities of past national disasters have required ever more sophisticated responses beyond fire and law enforcement. The Infrastructure Security Partnership stated,

> Hurricane Katrina clearly demonstrated that existing federal, regional, state, and local disaster management plans need improvement to deal with extreme disasters, natural or man-made, and that new thinking, approaches, training, and exercises, as well as unprecedented intergovernmental collaboration and planning are required.[16]

Increasing reliance is being placed on infrastructure sectors because they have such an important role during major catastrophic events.

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[12] William V. Pelfrey, "The Cycle of Preparedness: Establishing a Framework to Prepare for Terrorist Threats," in *Journal of Homeland Security and Emergency Management* 2, no. 1, Article 5 (January 2005):7-8. http://www.bepress.com/jhsem/vol2/iss1/5/ [Accessed July 19, 2006].

[13] Richard Gelting and Mark Miller, "Linking Public Health and Water Utilities to Improve Emergency Response," in *Journal of Contemporary Water Research and Education,* issue 129 (October 2004): 22-26, http://www.ucowr.siu.edu/updates/129/gelting.pdf [Accessed September 19, 2006].

[14] William Bridges, *The Character of Organizations: Using Personality Type in Organization Development* (Palo Alto, CA: Davies-Black Publishing, 2000): 53 and 73.

[15] National Drinking Water Advisory Council, *Water Security Practices, Incentives, and Measures*, v.

[16] Infrastructure Security Partnership, *Regional Disaster Resilience: A Guide for Developing an Action Plan* (Reston, VA: American Society of Civil Engineers, June 2006), 3. http://www.tisp.org/rdr_guide [Accessed November 18, 2006].

B.   RESEARCH QUESTIONS

This research will examine one set of regional infrastructure agencies (water, gas, and electric) and address the following questions:

1.   What factors are inhibiting the agencies from collaboration?

2.   What factors are present that would enable these agencies to collaborate?

3.   What might be done to build their capacity to collaborate?

C.   ARGUMENT

Modern society is complex and life could not continue without today's extensive infrastructure networks. Critical to the success of this nation's security is communication, cooperation, and coordination among all the stakeholders in a jurisdiction, region and the nation. This is especially important for the infrastructure sectors because the independent, yet networked systems make coordination challenging and complex.

Disaster preparedness is not a task but a process often reflecting a great need with a weak capability. Although collaboration is necessary to achieve the required capabilities of regional and national preparedness, the absence of a collaborative benchmarking model inhibits attaining this goal. "Although most planning guidance relating to critical infrastructures acknowledges the interdependencies both within and among sectors, robust plans for dealing with those interdependencies have yet to emerge."[17] Hocevar, Thomas, and Jansen found that "collaboration for homeland security is occurring in the context of under-designed institutional relationships. The alternative to design is organization 'by-default,' which is likely to be inadequate, as recent cases reveal."[18] There are some that may argue that cross-sectoral planning could complicate the allocation of scare resources (i.e., time, money, personnel and material). This argument has its merits, but it overlooks that engaging in partnerships would help all the members recognize the capability to share resources and identify the shared assets that

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[17] Homeland Security Advisory Council, *Report of the Critical Infrastructure Task Force*, 8.

[18] Hocevar, Thomas, and Jansen, *Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness*, 27.

warrant protection. The apparent unwillingness to acknowledge the importance of partnering with other sectors could be indicative of a diminished capacity to collaborate. Overall, the Department of Homeland Security has made progress establishing strategic policy and vision for national preparedness efforts. However, Mesa's utilities and interdependent sectors face the task of overcoming an ingrained organizational culture that seems to emphasize independence and autonomy. Because preparedness efforts are still disjointed, this could result in a weakened capacity of all the sectors to recover from national disasters.[19] Unless practices are changed, the effects of hazards will not abate and problems could continue or worsen.

D.   SIGNIFICANCE OF THE RESEARCH

During a disaster, collaboration tends to be initiated on an ad-hoc basis, involving multiple response agencies working together under the National Incident Management System (NIMS). These unified commands either efficiently complete the mission objectives or ineffectively respond together. Research focusing on the dynamics of collaboration is needed to test models that clarify the concept of collaborative capacity and consequently enhance the achievement of collaboration. The purpose of this research is two-fold: First, this research will help validate Hocevar, Thomas, and Jansen's model of collaborative capacity[20] and, second, this research looks to encourage the City of Mesa's utilities and interdependent sectors to engage in the local, regional and national preparedness efforts and provide an example for other communities and regions to benchmark.

E.   CONCLUSION

Providers of essential services have been put to the test by terrorist attacks and the onslaught of natural disasters. From the aftermath of 9/11 to the hurricanes Katrina and Rita bearing down on the U.S. Gulf Coast, preparedness has taken center stage. This thesis seeks to address the gap between recognizing the need to collaborate and

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[19] *Guidance on Aligning Strategies with the National Preparedness Goal*, 2-4.

[20] Hocevar, Thomas, and Jansen, *Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness*.

implementing an actionable strategy to begin these interactions. The next chapter reviews the existing research related to cross-sectoral collaboration and the gaps that inhibit this process from occurring.

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II.   LITERATURE REVIEW

> It has long been recognized that among public utilities, water supply facilities offer a particularly vulnerable point of attack to the foreign agent, due to the strategic position they occupy in keeping the wheels of industry turning and in preserving the health and morale of the American populace.[21]
>
> — Federal Bureau of Investigation Director J. Edgar Hoover, 1941

A.   INTRODUCTION

This chapter addresses relevant literature relating to critical infrastructure interdependencies, especially the water sector, and the contributing factors for a diminished capacity to collaborate. The review has five sections: federal policies; state, local, and private sector rights; critical interdependencies; lessons learned; and an academic model of collaborative capacity.

B.   FEDERAL POLICIES

Strategic policies (e.g., NIPP) emphasize that cross-sectoral collaboration is the most effective approach for achieving the goals of homeland security. The Homeland Security Advisory Council (HSAC) and the Infrastructure Security Partnership (TISP) recommend that the first and foremost strategic objective is creating critical infrastructure resiliency through a cooperative and coordinated effort. "Creation of more resilient critical infrastructures will require unprecedented collaboration and cooperation between disparate stakeholder communities."[22] The consequences of Hurricane Katrina revealed that intergovernmental collaboration and planning must occur at all levels of government with cooperation from private-sector stakeholders.[23] For instance, the response agencies

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[21] Claudia Copeland and Betsy A. Cody. "Terrorism and Security Issues Facing the Water Infrastructure Sector." *CRS Report for Congress* (Washington, DC: Federation of American Scientists, May 2007): 1. http://www.hsdl.org/homesec/docs/crs/nps32-060507-06.pdf&code=b2059dd1f6c66c5b4779307d591baaa2 [Accessed June 6, 2007].

[22] Homeland Security Advisory Council, *Report of The Critical Infrastructure Task Force*, 11.

[23] The Infrastructure Security Partnership, *Regional Disaster Resilience: A Guide for Developing an Action Plan,* 3.

in the gulf region had emergency response plans, but these were created in isolation and were not coordinated with similar organizations or key customers.

The National Infrastructure Protection Plan (NIPP) is the latest attempt by policy makers to establish a unified strategy for collectively protecting the nation's critical infrastructures.[24] The NIPP resulted from a voluntary collaboration of government with the state, local and private sector partners on matters related to homeland security.[25] The plan clarifies the coordination of information sharing, intended roles and responsibilities for all critical infrastructure protection (CIP) participants and a long-term risk management process. Recommendations outlined by the NIPP emphasize the need for increased collaboration among the homeland security community for effective implementation of the plan. Strategic policy is the mainstay of the federal government's ability to effect change. Collectively, there are twelve federal-level strategies that attempt to provide a framework for enhanced levels of preparedness. The NIPP is one of the twelve policies (Figure 1) that focuses on increasing the resiliency of the nation's infrastructure. The following figure displays how the individual strategies and legislation, presidential directives, and national initiatives work in concert to provide homeland security guidance.

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[24] *National Infrastructure Protection Plan,* 1-33.

[25] Bob Stephan, "National Infrastructure Protection Plan Represents Collaboration between Government and the Private Sector," in *CIP Report* 5, no. 2 (August 2006): 3-5. http://cipp.gmu.edu/archive/cip_report_5.2.pdf [Accessed August 15, 2006].
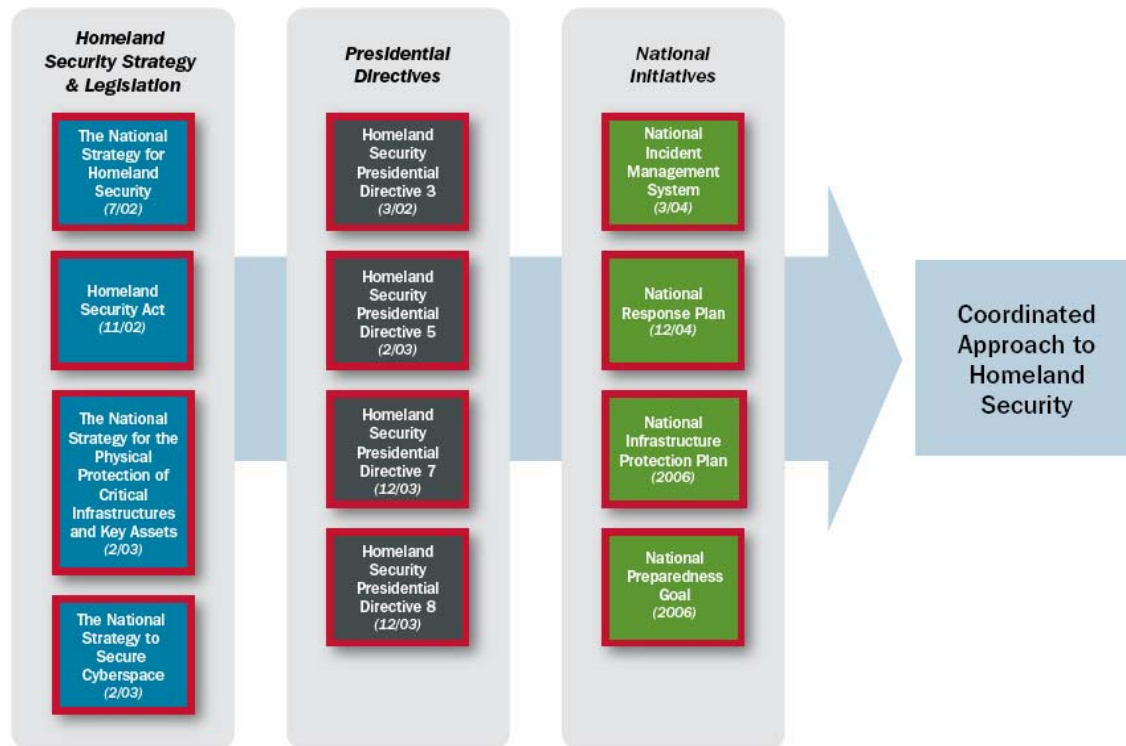
Figure 1.   Organization of Homeland Security: Related Authorities (from Environmental Protection Agency Sector Specific Plan).[26]

Despite the federal government's efforts, the extent to which many of these policies and recommendations have been fully implemented remains unclear. The Government Accountability Office determined that top-level coordination for doing Katrina-related work was lacking. Despite the establishment of strategic homeland security goals, doubts exist as to whether federal policy makers have enhanced the national efforts to secure, protect and prepare critical infrastructures from failure.[27] However, some of the state, local and private sector's own peers are calling for increased support of the federal government to assume a greater position with responsibility and

[26] Environmental Protection Agency, *Water: Critical Infrastructure and Key Resources Sector-Specific Plan as Input to the National Protection Plan* (Washington, DC: Environmental Protection Agency, EPA 817-R-07-001, May 2007): 9, http://www.epa.gov/safewater/watersecurity/pubs/plan_security_watersectorspecificplan.pdf [Accessed May 22, 2007].

[27] *Hurricane Katrina, Providing Oversight of the Nation's Preparedness, Response, and Recovery Activities* (Washington, DC: U.S. Government Accountability Office, GAO-05-1053T, September 2005): 9-10, http://www.gao.gov/new.items/d051053.pdf [Accessed September 5, 2006].

control over state and local decisions regarding CIP.[28] The American Water Works Association, Water Environment Federation, and the National Drinking Water Advisory Council have assessed that forging reliable and collaborative relationships with communities, managers of critical interdependent infrastructure and response agencies will enhance resiliency through the implementation of the NIPP.[29] The trend to accept the federal government's role in establishing strategic policy is a product of the increased awareness of the consequences associated with major disasters. Interagency collaboration involving regional and national infrastructures will be required to initiate the appropriate response to future national disasters. Preplanning is crucial to ensure interoperability of multi-agency missions and objectives.

C.   STATE, LOCAL, AND PRIVATE SECTOR RIGHTS

Federal policy makers promulgate national strategies with goals and objectives achievable through cross-sector collaboration. Technical experts represent sector-specific members that directly initiate the operational tactics for securing critical infrastructures at state and local levels. They tend to adhere to the viewpoint that state, local, and private sectors possess the right to adapt the federal strategies as deemed practical for their respective needs. The Department of Homeland Security's role with initiating "overarching" policies affecting state, local, tribal and private organizations is a point of contention with members of the state, local and private sector. They favor the flexibility to establish homeland security agendas specific to their community's needs following the "traditional federalist paradigm."[30]

The establishment of water and wastewater agency response networks is an example of how state, local and private sectors are attempting to collectively prepare for emergencies. The existing federal initiatives that support the development of

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[28] Ted Lewis and Rudy Darken, "Potholes and Detours in the Road to Critical Infrastructure Protection Policy." *Homeland Security Affairs* I, no. 2 (Fall 2005): 1-11. http://www.hsaj.org/?article=1.2.1 [Accessed September 7, 2006).

[29] National Drinking Water Advisory Council, *Water Security Practices, Incentives, and Measures*, 27-32.

[30] ABS Consulting, *Homeland Security Law Handbook* (Rockville, MD: Government Institutes, 2003): 35-36.

Water/Wastewater Agency Response Networks (WARN) fall under Homeland Security Presidential Directives (HSPD) 5, 7, and 8.[31] Examples of this are found in Florida and California, where the Water Agency Response Network (WARN) programs are considered models for other water/wastewater agencies. These WARN programs are recognized by the Federal Emergency Management Agency and encouraged under the provisions of NIMS for grant monies and reimbursement. In addition, the Environmental Protection Agency, "encourages local utilities in every state to establish intrastate mutual aid agreements such as a WARN to enhance preparedness and improve incident response."[32] The WARN programs organize utilities within a state through mutual aid agreements to provide assistance with personnel and resources in natural and human-caused disasters.

D.   CRITICAL INTERDEPENDENCIES

Critical infrastructures (e.g., water, electric, and natural gas) operate in a complex and highly interdependent environment. To the extent to which planning and problem solving within sectors ignores these interdependencies a risk is created that can impact the resiliency of the independent infrastructures. Unfortunately, a recent assessment by the Critical Infrastructure Task Force of the Homeland Security Advisory Council finds that sector planning is not addressing these critical interdependencies. "Although most planning guidance relating to critical infrastructures acknowledges the interdependencies both within and among sectors, robust plans for dealing with those interdependencies have yet to emerge."[33] These interconnected infrastructures are subject to disruptions that can have broad regional, national, and global consequences. For example, the tie between power and water sectors is one of the key infrastructure interdependencies that exhibit the capability to impact large regions. When these two sectors do not jointly plan and

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[31] California WARN, *Water/Wastewater Agency Response Network*: *Statewide Mutual Assistance*, http://www.calwarn.org/ [Accessed May 22, 2006].

[32] *Water: Critical Infrastructure and Key Resources Sector-Specific Plan as Input to the National Protection Plan,* 66.

[33] Homeland Security Advisory Council, *Report of the Critical Infrastructure Task Force,* 8.

prepare, this may demonstrate an assumption that failures are likely to result from a single cause and effect variable when in most cases there are many factors that are to blame.

> When interrupted, either unintentionally as a result of a severe weather event or intentionally through an act of terrorism, not only can these networks fail, but failure in one location can cascade through many other locations across the sector network. Of course, failure in one infrastructure sector can result in failure in other linked infrastructures.[34]

Realizing that the individual systems are each a component of a larger system will help identify the multiple, complex scenarios and to understand the relationships involved. "Interdependencies" implies that two or more infrastructures depend on each other.

> On the surface, it might appear that most infrastructure sectors operate distinctly, as mutually exclusive spheres serving various parts of the national economy. Nothing could be further from the truth. Every critical infrastructure sector complements and depends on others, creating economies of scale and the accumulation of human and material capital.[35]

In Figure 2, an example of the water sectors dependencies on other sectors is visually depicted. The multiple ties between vendors and essential services become more apparent. In the following figure, seven critical links are attributed to the water sector (node). The loss of any one of these interdependencies (links) would adversely impact the sustainability of services.

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[34] Marilyn Ware. *Challenges of the Partnership: Pulling Together the Public and Private Sectors* (Carlisle, PA: Army War College, 2003): 100, http://www.hsdl.org/homesec/docs/dod/nps21-081705-33.pdf [Accessed April 28, 2007].

[35] Steven Roberts, "Critical Infrastructure Protection and Homeland Security," in *Perspectives on Preparedness* 15 (July 2003): 3. http://www.hsld.org/homesec/docs/jfk/nps03-121003-03.pdf&code=b34a449a971ccd757a4f14efff10012b [Accessed April 28, 2007].
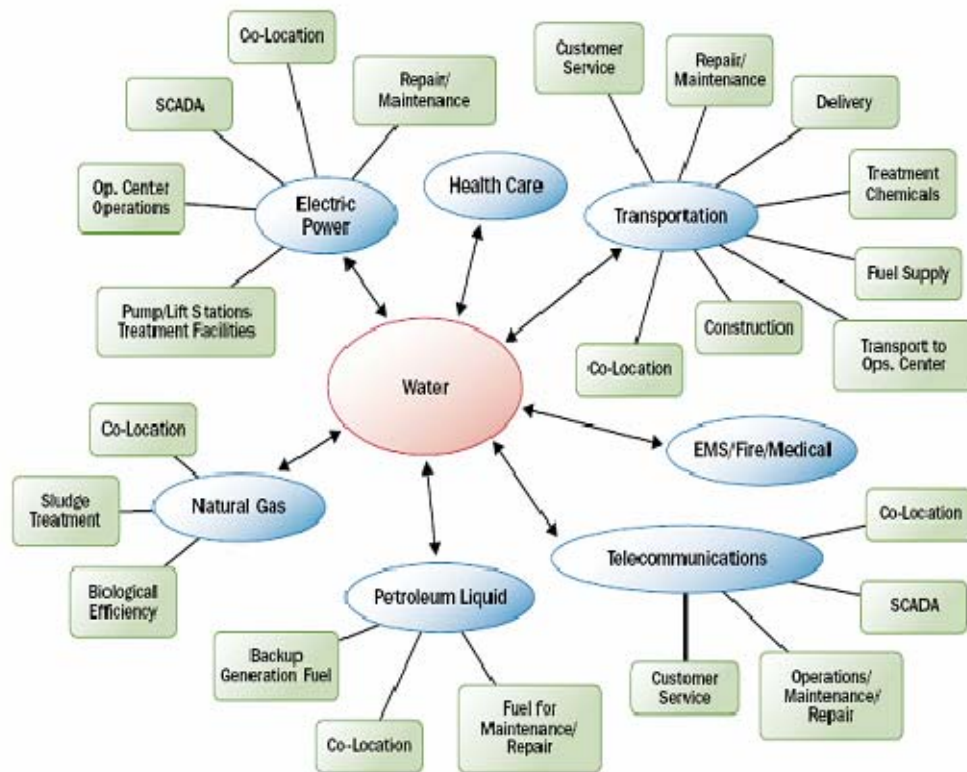
Figure 2.   Interdependencies with Water Sector (from Environmental Protection Agencies Sector Specific Plan).[36].

These linkages vary in scale and complexity and can be described in four general categories. The categories are: Physical interdependencies (when the material output of one infrastructure is used by another); Cyber (electronic information links between and among infrastructure); Geographic (where two or more infrastructures are co-located, such as a common corridor); and Other (interdependencies that do not fit previous categories and include those such as financial markets).[37] Interdependencies have to be acknowledged and addressed as a calculated measure for preparedness.

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[36] *Water: Critical Infrastructure and Key Resources Sector-Specific Plan as Input to the National Protection Plan,* 51.

[37] Brandon J. Hardenbrook, "The Need For A Policy Framework to Develop Disaster Resilient Regions," in *Journal of Homeland Security and Emergency Management* 2, Iss. 3, Article 2 (2005): 3. http://www.bepress.com/jhsem/vol2/iss3/2 [Accessed October 30, 2006].

Work done in advance of possible disasters and emergencies is an essential aspect of effective collaboration. The time to start forming a good relationship with other infrastructures is not when disaster strikes; getting to know each other beforehand ensures improved responsiveness and recovery from a system-wide or regional failure.

> Experience shows that one of the important issues in disaster preparedness and survival is to engage entire organizations and their partners in preparing for risks. In other words, it is not enough to have an emergency plan, unless it really engages all the necessary players in preparation and response.[38]

There is growing awareness that critical infrastructure is in need of an operating system that promotes a wider base of participation rather than relying on exclusivity; that fosters organizational partnerships rather than maintaining strict top-down hierarchies. In that light, the critical infrastructures are called to foster a "culture of preparedness" where collaboration informs our security and direction.

E.   LESSONS LEARNED

Past disaster responses present lessons for utilities on how to be more self-sufficient and filling the gap between disaster onset and arrival of other government aid. A recent study described lessons-learned from the water utility vulnerability assessments and outlined related recommendations. For example, within the context of "Mission Objective," the water utility experts identified addressing interrelationships across sectors as being most beneficial. Respondents identified that critical interdependencies were initially missed in their vulnerability assessments. The water sector is not the only focus; all infrastructure sectors need to communicate outside of their domain and include outside sectors in the planning process.[39]

The lessons learned following the events that occurred at the World Trade Center are relevant to all sectors. The most important lesson is to minimize the influence of

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[38] Neil S. Grigg, *Surviving Disasters in Water Utilities: Learning From Experience* (Denver, CO: Awwa Research Foundation, 2002), 35.

[39] Sandia National Laboratories, *Results from the Water Utility Vulnerability Assessment Lessons Learned Study* (Denver, CO: Awwa Research Foundation, 2003), B12-B19.

organizational biases. In a report that discusses the hindrances of information sharing on 9/11, the author states that "organizational bias stems from the desire to belong to an omnipotent group that is capable of excluding those who are not part of the group."[40] This inward-looking approach can only stifle the ability of the utility sectors to collectively prepare for emergencies. Again the author states that "this inter-group competition is illustrated by an absence of cooperation, duplication of effort, and strict control of information that might benefit other groups."[41] Within the domain of homeland security, the influences of inter-group competition need to be recognized and measured for improvement formalized. Resiliency will not be obtained until the disparate sectors can work together and collectively speed recovery of essential services.

To address the necessity for effective cross-sector collaboration, several partnerships have conducted exercises to identify existing deficiencies in collaboration (e.g., resources, communication, and joint contingencies). The Pacific Northwest Partnership for Regional Infrastructure Security conducted a series of "table-top" exercises called Blue Cascades I, II, and III.[42] The summary of key findings and recommendations identified from each exercise are as follows:

- Roles and responsibilities of various government authorities at all levels in a large-scale regional terrorist attack or disruption were unclear.
- Many people appeared not to understand how cascading and simultaneous infrastructure failures and physical destruction of critical assets could paralyze parts of the region.
- Cross-sector information sharing is still in its infancy, but acknowledged as vital to disaster preparedness and management.
- Roles and responsibilities still were not clear and the participants questioned usefulness of National Response Plan. [43]

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[40] Joseph W. Pfeifer, "Understanding How Organizational Bias Influenced First Responders at the World Trade Center," in *Psychology of Terrorism,* ed. by Bruce Bongar et al. (Oxford, NY: Oxford University Press, 2007): 211.

[41] Pfeifer, "Understanding How Organizational Bias Influenced First Responders," 211.

[42] Partnership for Regional Infrastructure Security, *Infrastructure Interdependencies Tabletop Exercise: Blue Cascades III* (Seattle, WA: Pacific Northwest Economic Region, March 2006):10-15. http://www.pnwer.org/pris/finalrep.pdf [Accessed November 17, 2006].

[43] Partnership for Regional Infrastructure Security, *Blue Cascades III*, 15-19.

In an entirely separate region of the nation, the Gulf Coast Regional Partnership for Infrastructure Security in New Orleans conducted a separate series of exercises called Purple Crescent I and II.[44] The findings and recommendations were very similar to those identified in the Northwest Region. The summary of key findings and recommendations identified from each exercise are as follows:

- No regional strategy was incorporated to improve preparedness or to coordinate response across sectors and jurisdictional boundaries.

- Most organizations had emergency response plans, but these were created in isolation, focused on internal needs, and are not coordinated with similar organizations within and outside of their sector.

- Gaps existed within the areas of awareness and understanding of infrastructure interdependencies.[45]

The lessons learned from Hurricane Katrina identify the relationships among the sectors, local, state and federal governments as being the nexus for preparedness.[46] The federal government has attempted to promote cross-sector collaboration through the process of implementing strategic plans and initiatives. A major outcome of this effort is the National Infrastructure Protection Plan (NIPP). The cornerstone of the NIPP is collaboration.[47] The following figure visually depicts how the NIPP envisions this relationship to occur. The plan's architecture involves the government (sector specific agencies) and sector specific coordinating councils working together in conjunction with cross-sector councils to share information and lessons learned.

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[44] Gulf Coast Regional Partnership for Infrastructure Security, *Infrastructure Interdependencies Tabletop Exercise: Purple Crescent* (New Orleans, LA: The New Orleans Regional Chamber of Commerce MetroVision Economic Development Partnership, October 2003): 1-8. http://www.naruc.org/associations/1773/files/purplecrescent.pdf [Accessed February 25, 2007].

[45] Gulf Coast Regional Partnership for Infrastructure Security, *Purple Crescent*, 2-4.

[46] *The Federal Response to Hurricane Katrina: Lessons Learned* (Washington, DC: White House, February 2006):1-6. http://www.unitedwaydallas.org/News/HurrRelDocs/PressRelease_TheWhiteHouse_060223.pdf [Accessed January 17, 2007].

[47] *National Infrastructure Protection Plan*, 14.
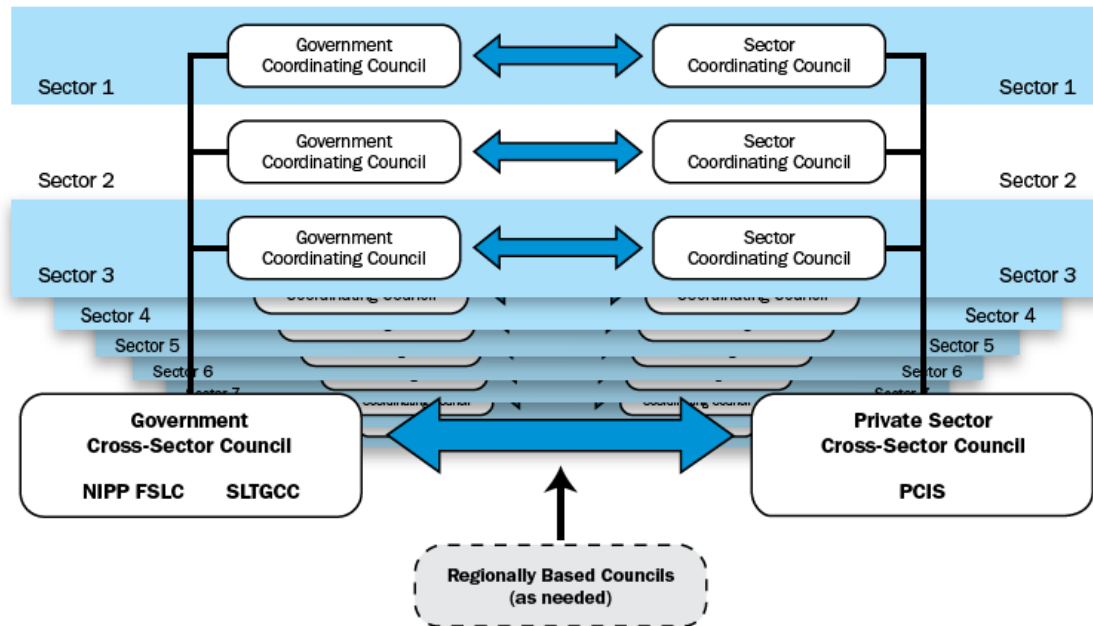
Figure 3.   DHS Sector Partnership Model (from Environmental Protection Agency Sector Specific Plan).[48].

The Department of Homeland Security assumes the sectors possess the capacity to partner. However, in reality not all of the critical infrastructures engage in this type of relationship. This is evident with Mesa's utilities and interdependent sectors. "There are no federal standards or agreed-upon industry best practices within the water infrastructure sector to govern readiness, response to security incidents, and recovery. The Environmental Protection Agency is not authorized to require water infrastructure systems to implement specific security improvements or meet particular security standards."[49] Therefore, the United States federal government recommends that the individual sectors collaborate.

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[48] *Water: Critical Infrastructure and Key Resources Sector-Specific Plan as Input to the National Protection Plan,* 98.

[49] Copeland and Cody, "Terrorism and Security Issues Facing the Water Infrastructure Sector," 6.

F. ACADEMIC MODELS OF COLLABORATIVE CAPACITY

Given the strategic policy initiatives described above and the perceived benefits documented for multiple and diverse agency partnerships, it is unclear why members of the homeland security community don't collaborate more effectively. The ability to protect, respond and recover is collectively a function of all agencies working together. Academic research has theorized the hindrances and enablers to group collaboration. One academic study has taken preliminary steps to identify indicators and dimensions of this phenomenon. In *Building Collaborative Capacity* the researchers present a preliminary model and set of hypotheses.[50] The model provides a diagnostic process for self-reflection and learning and provides a mechanism to self-evaluate the current collaboration and desired working relationships.
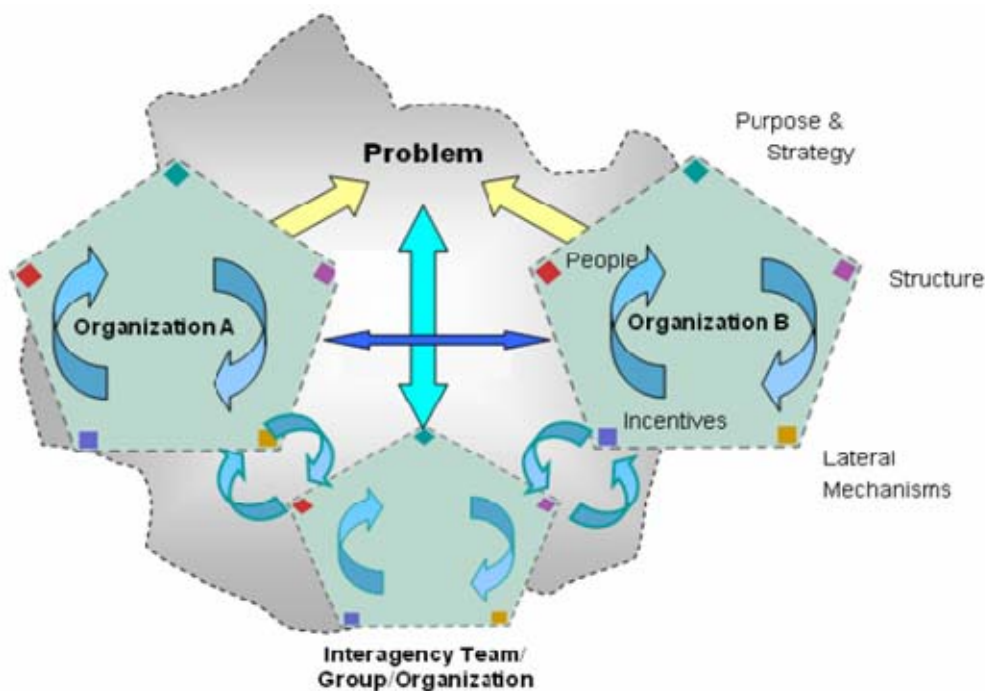
Figure 4.   Developing Organization Design Dynamics to Improve Collaborative Capacity[51]

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[50] Hocevar, Thomas, and Jansen, *Building Collaborative Capacity: An Innovative Strategy for Homeland Security Preparedness,* 3.

[51] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 10.

This model (Figure 4) provided the foundation for this research and establishes the criteria with which to quantify the results. Consistent with the model the individual findings will be grouped by the specific dimensions (e.g., Purpose and Strategy, Structure, Lateral Mechanisms, Incentives, and People) to identify where changes should be focused.

The capacity for collaboration is enhanced by developing the factors within and relationships between each of the dimensions. "Purpose can be driven by a commonly perceived risk or threat ("felt need") or a common goal such as improving information sharing, coordinated training or overall preparedness."[52] The absence of a common goal or purpose will limit the effectiveness of aspects of formalized structure. Structure for collaboration involves role clarity, dedicated assets (i.e., time, people), and formalized processes (i.e., policies, procedures) that increase accountability for collaboration.[53] These cannot be effectively established without organizational grounding in a shared strategy or purpose for collaboration. Possessing the authority to make decisions and to interact with other sectors enables effective communications between sectors. Effective communications is a sub-dimension of "Lateral Mechanism" that involves "increased familiarity through interpersonal networks."[54] Increased familiarity can foster incentives to collaborate. "Incentives and disincentives are extraordinarily important if collaborative intent is to be translated into performance."[55] Incentives encourage collaboration through rewards, decrease in competition and sharing resources. Considering the four dimensions (Purpose/strategy, Structure, Lateral Mechanisms and Incentives), collaboration can not occur without "people" and the capacity of these individuals to interact. "For example, the capacity of an organization to share information also depends on the willingness of its people to share information."[56] The alignment of all five dimensions both within individual organizations and between the interdependent sectors will determine the organization's capacity to collaborate.

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[52] Hocevar, Thomas, and Jansen, *Building Collaborative Capacity: An Innovative Strategy,* 6.

[53] Ibid., 14.

[54] Ibid., 10.

[55] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 25.

[56] Ibid., 26.

The research by Thomas, Hocevar, and Jansen recommends that future research focus on further testing the hypotheses and refining the concepts and model.[57] A central motivation for this thesis research has been to further the development of these concepts and provide a catalyst for changing relationships and roles of key homeland security professionals in Mesa. This transformation could enhance collaboration between the disparate sectors and heighten preparedness efforts. This thesis seeks to incorporate the research conducted by Hocevar, Thomas, and Jansen, by delving into the hindrances and enablers of an organization's capacity "to enter into, develop, and sustain inter-organizational systems in pursuit of collective outcomes."[58] The authors recommend that data can be used as feedback to key organizational leaders to increase awareness and possibility foster change initiatives to improve collaboration.[59] The Collaborative Capacity Model and recommended diagnostic approach is used as the basis for the methodology for this study (see Chapter III). The model uses three data gathering techniques: interviews, survey questions and interpretation and feedback. The interviews help select the targets from which to select survey questions from the Collaborative Capacity Item Bank.[60] The results of the survey are provided to the participating organizations for interpretation and recommendations. The model diagnoses the organizational factors that both enable or impede collaboration while also identifying steps toward improved collaborative capacity.

Another academic model contributes to identification of factors that influence the capability to collaborate.[61] "Character is the personality of the individual organization; it is the DNA of the organizational life form. It is the organization's character that makes it feel and acts like itself."[62] Unfortunately, changing an organization's character is a long and difficult process. Identifying the influences (e.g., enablers and barriers) that these

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[57] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 30.

[58] Ibid., 3.

[59] Ibid., 16.

[60] Ibid., 19-47.

[61] Bridges, *The Character of Organizations,* 1.

[62] Ibid., 1.

"personality traits" exhibit on the capacity to collaborate will enable sector managers to take initiatives to improve Mesa's capability to achieve Homeland Security critical infrastructure protection.

Utility organizations may find it difficult to implement the NIPP and its requirements for collaborative behaviors. Utilities, by nature, are stable organizations and attribute their success to rules, hierarchy and specialization.[63] Through the division of labor, utility organizations are highly specialized. This specialization of services has occurred over time and promotes the establishment of conflicting objectives and competition for scarce resources (e.g., money, employees, and equipment). Interactions are not exclusively a challenge to interdependent sectors, but equally challenging to the internal divisions of the organization. Robert Herbold attributes this dilemma to the "Fiefdom Syndrome." Considering government fiefdoms, getting these organizations to collaborate can be difficult.[64] Pressures for organizational change have existed (e.g., Terrorist event training, increased efficiency, and lowering costs) particularly since September 11, 2001. However, government agencies typically lack the capability to collaborate due to the *Fiefdom Syndrome*. Herbold correlates how human traits lead to the creation of "fiefdom's" or self-sufficient entities and that getting these "fiefdoms" to collaborate could be very difficult. Local government typically gets stuck at the "closing in" phase or maintaining the "status quo," which personifies the bureaucracy and political "red tape."[65] Case studies document this narrow scope of cooperation and illustrate that the water sector is collaborating among other water utilities and local first responders, but lacks partnerships across interdependent sectors.[66]

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[63] Steven Kelman, *Unleashing Change: A Study of Organizational Renewal in Government* (Washington, DC: Brookings Institute Press, 2005), 27-29.

[64] Robert J. Herbold, *The Fiefdom Syndrome: The Turf Battles That Undermine Careers and Companies- and How to Overcome Them* (New York, NY: Doubleday, 2004): 41-46.

[65] Bridges, *The Character of Organizations*, 73.

[66] Environmental Protection Agency, *Security Information Collaboratives: A Guide for Water Utilities* (Cincinnati, OH: Office of Research and Development, 625/R-05/002, May 2005): 15-25. http://www.epa.gov/ordnhsrc/pubs/brochureSIC051805.pdf [Accessed August 30, 2006].

G.   CONCLUSION

Key issues were identified in the available research that detailed the complex nature of cross-sector collaboration. However, existing academic research posits the ability to audit an organization's capacity to collaborate. This thesis seeks to both further the development of the diagnostic instrument developed by Thomas, Hocevar and Jansen, as well as use resulting data to initiate thoughtful discussions among utility sectors in the City of Mesa. This process could eventually establish a benchmark for similar organizations and regions. At a minimum, the utilities should have reliable and collaborative partnerships with customers, managers of independent interrelated infrastructure and managers of response organizations.[67] But there are challenges to collaboration. The General Accounting Office found barriers to interagency interactions within the federal government stating, "Agency missions that have evolved over time often have conflicting objectives that reflect different aspects of complex public problems. This makes interagency coordination both more necessary and more difficult."[68] Therefore, identifying both the barriers and enablers that affect the water sector's capacity to collaborate would be beneficial. The next chapter describes the research methodology for diagnosing the collaborative capacity of Mesa's utilities and interdependent sectors.

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[67] National Drinking Water Advisory Council, *Water Security Practices, Incentives, and Measures.* 27.

[68] *Managing for Results, Barriers to Interagency Coordination* (Washington, DC: U.S. General Accounting Office, GAO/GGD-00-106, March 2000): 9. http://www.gao.gov/archive/2000/gg00106.pdf [Accessed November 8, 2006].

III. RESEARCH METHODOLOGY

A. INTRODUCTION

This chapter explains the methodology used for examining the City of Mesa's capacity to engage in cross-sector collaboration. Considering the separate administrative levels responsible for emergency planning, response and recovery actions, this research collected data from both senior and middle managers within Mesa's Utility Department. Interviews and questionnaires were used to capture the individual perceptions and experiences of senior and middle mangers. The data collected from the interviews were analyzed and the results were used to select questionnaire items for a survey of factors related to collaborative capacity. Surveys were administered to senior and middle managers. The completed survey provided data on the participants' perceptions of different factors that can both impede and enable collaboration in their respective organizations. The consolidated results were shared with survey participants and their feedback was solicited in terms of both interpretations and recommendations.

B. DESCRIPTION OF RESEARCH SITE

The City of Mesa serves the citizens of Mesa, Gilbert, Apache Junction, Chandler, Queen Creek and unincorporated areas of Maricopa County. Mesa is the third largest city is Arizona and the fortieth largest city in the United States. Providing for the economic growth and quality of life, Mesa owns and operates several utilities including electric, gas, water and wastewater. In addition, interdependencies exist with Salt River Project (electric provider), Southwest Gas, and El Paso Gas (natural gas provider) for the sustainability of essential services. The water sector consists of basic, yet vital, components: water supply, treatment and distribution and wastewater collections and treatment. On the supply side, the primary focus of critical infrastructure protection efforts is the public water system. This system depends on reservoirs, dams, wells, and aquifers; as well as holding, filtration, cleaning, and treatment facilities, pumping stations, transmissions pipelines, and other delivery mechanisms that provide for

domestic and industrial applications, including firefighting.[69] The wastewater utility emphasis is on the municipal sanitary sewer system, including hundreds of miles of collections lines. The wastewater utility collects and treats sewage and processes water from domestic, commercial, and industrial sources.

Interruption of water service can significantly impact public health, sanitation, business operations, and reduce the city's ability to fight structure and wild land fires. Degradation of water quality for consumption can pose a significant threat to the health and safety of the people in the region.

C.   INITIATING THE RESEARCH PROJECT

Mesa's ability to impact the resiliency of multiple sectors both regionally and possibly across the western United States, defines the importance for assessing the individual utility's (e.g., water, wastewater, electric and natural gas) capacity to collaborate. To gain support for this research, a meeting was held with the Utility Department Manager exploring the role that collaboration would have on the effective operation of the utility organizations in Mesa. The manager determined potential benefits could be gained from identifying both barriers and enablers of collaboration. Through this discussion, the manager endorsed the project and offered the resources necessary to complete the research. Based on the manager's approval, key senior level personnel were identified to participate representing their respective disciplines of water, wastewater, electric and natural gas, including senior level staff of the interconnected sectors. Throughout the research process utility managers would actually be engaged in examining the results and providing their own assessment of interpretation and recommendations as a way to have the data potentially instigate improvements to collaboration.

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[69] *Drinking Water, Experts' Views on How Federal Funding Can Best Be Spent to Improve Security* (Washington, DC: U.S. Government Accountability Office, GAO-04-1098T, September 2004): 3-4. http://www.gao.gov/new.items/d041098t.pdf [Accessed March 28, 2007].

1. Participant Selection

Ten members from senior management were selected based on their ability to establish strategic goals, initiatives, and possess the capability to affect change within their respective organizations. These participants represented all seven senior management positions of Mesa's four utilities (e.g., water, wastewater, electric and natural gas), and three from the interconnected sectors (e.g., water, electric and gas). The participants of each management group are practitioners and considered experts in their respective disciplines. Each senior manager was contacted via email to gain their participation and to schedule initial interviews. Furthermore, the senior managers were requested to provide the names of middle managers as key informants for this research.

The senior managers identified thirteen individuals from middle management to participate in this research. These middle managers were selected based on their ability to establish operational objectives, initiatives, and possessed the capability to influence change within their respective disciplines and organizations. These participants represent all middle management in Mesa's four utilities and interdependent sectors. Each participant was contacted via email by the author to confirm their willingness to participate in the study and to schedule initial interviews. The same format was used for senior management.

2. Qualitative Data Collection

The initial interviews were scheduled to achieve two goals. The first goal was to assess their willingness to participate in the written survey, because without their input the research would not be complete. The second goal was to gain an understanding of views on cross-sector collaboration. Six interview questions were selected from the Collaborative Capacity Audit provided by Hocevar, Thomas, and Jansen.[70] Questions were chosen that best fit the situation in the City of Mesa. These key questions formed the framework for the semi-structured interviews. For the senior managers, questions included,

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[70] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity,* 20.

1. What is the central (initiating) problem or opportunity that motivates interagency collaboration?

2. How does this problem or opportunity create a need to collaborate?

3. What type of collaboration occurs at your level of the organization?

4. Who are the critical stakeholders and what are their stakes in this context?

5. What degree of collaboration would be required for cross-sector partnerships?

6. What are the primary values or beneficial outcomes to be gained by collaboration?[71]

For the middle managers, questions 1, 2 and 3, plus three additional questions were asked to tap unique interactions that may occur at this level. The three questions that were specifically administered to middle management are as follows,

7. What degree of collaboration is required or allowed?

8. Is there consensus as to the nature of the problem?

9. How does the value of collaboration vary between the different partners?[72]

To initiate the qualitative data collection, an email was drafted and sent out to the ten senior and thirteen middle managers of Mesa's utilities and interdependent sectors (Appendices A and B). The email outlined the basis of the research, the Utility Manager endorsement for this research, that the research would be used in a thesis at the Naval Postgraduate School, and that all responses and identities would be kept anonymous. Anonymity was a key concern to the manager and several of the participants. In addition, the respective sets of six interview questions were provided to senior and middle managers to provide an opportunity to respond electronically or prepare for the initial interviews. A caveat was included that specified any electronic response might require a follow up interview to clarify certain aspects of their responses.

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[71] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 19.

[72] Ibid., 19.

All twenty-three participants acknowledged receipt of the email, eight (three senior managers and five middle managers) provided electronic responses to the attached questions. All eight responses would require face-to-face interviews to clarify the individual perceptions and experiences; three would need to be followed up with telephone interviews because of their specific work locations. The three telephone interviews were conducted in the conference room for privacy and to maintain anonymity. The remaining seven senior managers and thirteen middle managers were scheduled for face-to-face discussions. Each interview was scheduled for one hour and was conducted in an available conference room. Prior to each interview the impetus for the research was provided to give the individual participants a basis for discussion. The following statement was used to provide this foundation,

> Through the experience of disasters, it isn't enough for organizations, governments, companies, or even whole infrastructure sectors to plan in isolation. Effective preparedness needs the cooperation of interdependent organizations, sectors and governments. The frequency and impact of natural and man-made disasters that affect the critical infrastructures are increasing. The infrastructures are also vulnerable to a changing threat environment, one that includes terrorist attacks.

In addition, ground rules were clarified with the interviewee. Anonymity was defined as no names would be used and no quotes would be used without their review and approval. Permission to record the interviews was requested to aid in dictation and to devote attention to the interview. All six questions were revisited and subsequent questions were asked to ensure the context of the discussion was clear. Notes were taken in conjunction with tape recordings to ensure key narratives were not lost.

The interviews and secondary interviews (five senior managers) provided an opportunity to capture the experiences and perceptions of critical infrastructure personnel regarding cross-sector collaboration. Findings from the emails and interviews were transcribed and coded to reveal common themes that enable or inhibit collaboration.

3. Thematic Analysis

This process demonstrates how analysis of the raw data from interview transcripts and email input progressed toward the identification of overarching themes that captured the phenomenon of cross-sector collaboration in Mesa from the perspective of senior and mid-level utility managers.[73] Four steps were used to process and analyze the data collected from the participants. Each step incorporates procedures similar to those used by the researchers Fereday and Cochrane.[74]

First the interview data were transcribed along with summarizing the email responses and interview notes. The transcribed data were studied for initial themes. A content analysis looking for themes that were present across respondents was performed.[75] For purposes of maintaining confidentiality, each participant was identified numerically. Next, a template of codes was selected within the context of the five domains that categorize the Diagnostic Questions for Measuring Collaborative Capacity.[76]

The initial themes were subsequently paired with the codes depending on whether it was a "driving force" or if the theme was indicative of a "barrier". As the storyboard progressed, multiple sub-dimensions of each domain surfaced. Capturing these sub-dimensions was critical for populating the survey with questions from the Collaborative Capacity survey item bank provided by the co-advisors Thomas and Hocevar.

D. SURVEY IMPLEMENTATION

The survey instrument for this research was designed specifically for the City of Mesa and interconnected sectors. The survey was distributed to all of the twenty-three senior and middle managers that participated in the initial interviews. The survey format

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[73] Jennifer Fereday and Eimear Muir-Cochrane, "Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development." In *International Journal of Qualitative Methods* 5, no. 1 (March 2006): 1-3. http://www.ualberta.ca/~iiqm/backissues/5_1/pdf/fereday.pdf [Accessed March 5, 2007].

[74] Fereday and Muir-Cochrane, "Demonstrating Rigor Using Thematic Analysis," 5.

[75] Ibid., 6.

[76] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 21-28.

was modeled after research of Thomas, Hocevar, and Jansen.[77] Using the data from the thematic analysis, thirty-five questions were selected from their survey item bank After the survey was designed and ready for distribution, an evaluative pre-test was conducted involving four non-related City of Mesa personnel representing the disciplines of water, wastewater, electric and natural gas, to test for weaknesses in the survey design and completion times. Upon receiving the pre-test results, the survey was revised and prepared for final distribution. The final version of the survey is provided in Appendix C. Each survey was mailed either through interoffice or postal mail. A self-addressed and stamped envelope was provided to ensure return of each survey. To maintain anonymity of the participants, no request for names or return addresses was requested.

1. Instrumentation

The survey instrument consisted of thirty-five questions. Keeping to the five dimensions of the Collaborative Capacity Audit, questions were selected based on the common themes identified by senior and middle managers. The five dimensions and the related questions are as follows:

- Purpose and Strategy: Four questions were selected.
- Collaborative Structure: Four questions were selected.
- Social Capital through Lateral Mechanisms: Eleven questions were selected.
- Incentives to Collaborate: Six questions were selected.
- People and People Processes: Ten questions were selected
- Demographics: One question was selected to determine level of management.[78]

In addition, each statement in the survey instrument provided an evaluation scheme. The evaluation scheme consisted of four choices that ranged from "strongly disagree" to "strongly agree" respectively positioned left to right. Each participant answered each statement indicating their level of agreement. The survey was designed to be taken in less than ten minutes.

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[77] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 21-28.

[78] Ibid., 37-47.

2. Quantitative Analysis

The completed survey data was entered into a spreadsheet for analyses. Response choices were numerically coded. For example, the number one was assigned to response of "Strongly Disagree" and the number four to the rating of "Strongly Agree." Inferential statistics were not required since the participants reflected the total population of senior and middle managers at the City of Mesa and interconnected sectors. The mean and standard deviation of each survey question was calculated using the total database. In addition, the mean and standard deviation was calculated separately for senior mangers' responses and middle managers' responses. For the purpose of analysis, the negatively worded questions were recoded for comparability. For example, if the mean value for a negatively worded question was high (i.e., 4.0), then the recoded mean value would equal 1.0. The complete set of findings from this analysis is displayed in Appendix D. For ease of disseminating the data to the participants, the combined statistics for the categories of "agree" and "strongly agree" were combined into a table along with the respective narrative statement from the survey. The tables itemize the statistics of senior mangers, middle managers, and the combined total. This quantitative feedback is used to describe specific findings in Chapter VI of this research.

E. PARTICIPANT INTERPRETATION OF FINDINGS

A meeting was conducted with the Utility Department Manager to review the quantitative data and determine important findings to which participants could provide interpretation and feedback. Additionally, the author solicited input from the researchers (Thomas et al. 2006) who designed the survey and interview item bank used in this study. Using this collective advice five findings were summarized on a response form to distribute to participants. One form was provided for each of the five findings and one additional form was provided for any additional findings about which the participant wanted to comment. The following is an illustrative example of the type of information contained on the response form:

> **Finding #1: Importance of collaboration**
>
> *90% of Senior Managers "Agree" with the importance of working with other sectors (Q4)*
>
> BUT
>
> *Senior managers unanimously (100%) "Disagree" that collaboration is a high priority for the organization (Q2), Why are the % response to these 2 questions so different?*
>
> How would you interpret this finding? What do you think it means, in the context of cross-sector collaboration?
>
> What recommendations would you make to address this?

Figure 5.   Example of Response Form.

A cover letter, a summary of the means for the total aggregate of responses, a summary of the means for the respective senior or middle managers and six response forms (Appendix E) were distributed by interoffice and postal mail. The goals of the response form were to solicit the participant's reactions to the specific findings and ask for their recommendations. This process allowed the participant a final opportunity to provide their interpretation of the data and recommendations to improve cross-sector collaboration within the City the Mesa. The "Response Form" was distributed to all twenty-three participants; but only eleven (48%) were returned. This qualitative data from the response forms are used in the discussions in Chapter V.

F.   CONCLUSION

This research incorporated the use of qualitative and quantitative analyses to explore the collaborative capacity in the City of Mesa utilities and interrelated sectors. The qualitative analyses involved conducting interviews with all of the twenty-three

participants and identifying themes that correlated with the five domains of the Collaborative Capacity Audit. In addition, the response form allowed the participants to give feedback on the selected five survey findings. This feedback will be integrated into a subsequent chapter. The quantitative analyses involved taking the results of the thematic analysis and populating the Collaborative Capacity Audit with questions from the item bank. The results of the surveys were quantified and analyzed for consistencies and inconsistencies between the interview, survey and response form data. These data identify the perceptions, interpretations and recommendations for improvement to begin improving the capacity to engage in cross-sector collaboration.

IV.   QUALITATIVE RESULTS

Protecting America's critical infrastructures and key assets calls for a transition to a new national cooperative paradigm. The basic tenets of *homeland security* are fundamentally different from the historically defined tenets of national security. *Homeland Security,* particularly in the context of critical infrastructures and key asset protection, is a shared responsibility that cannot be accomplished by the federal government alone. It requires coordinated action on the part of federal, state, and local governments; the private sector; and concerned citizens across the country.[79]

A.   INTRODUCTION

Forces act both in favor of (enablers) and against (barriers) a transition to a new cooperative paradigm. "At the core, success depends on robust and adaptive collaboration between the public and private sector, among different levels of government, among multiple jurisdictions, and among departments and agencies within a single jurisdiction."[80] A recent report "addresses this interest specifically by calling for stronger relationships between the water utilities and outside sectors, by forging reliable and collaborative partnerships with the communities, managers of critical interdependent infrastructure and response organizations."[81] This case study of the City of Mesa provides an assessment of the collaborative capacity of multiple infrastructure sectors. This chapter presents the results of 23 initial interviews that were conducted with ten senior managers and thirteen middle managers. Specifics of the data collection process are reported in Chapter II. The thematic analysis of these data provides additional depth to the research that cannot be gained through the quantitative analysis. This chapter

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[79] *The National Strategy for the Physical Protection of Critical Infrastructures and Key Assets* (Washington, DC: White House, February 2003): vii. http://www.whitehouse.gov/pcipb/physical_strategy.pdf [Accessed September 26, 2006].

[80] *State and Urban Area Homeland Security Strategy: Guidance on Aligning Strategies with the National Preparedness Goal*, 4.

[81] National Drinking Water Advisory Council, *Water Security Practices, Incentives, and Measures*, v-viii.

includes three parts: influences that enable collaboration, factors that serve as barriers to collaboration, and a summary of the findings.

B.   ENABLING FACTORS OF COLLABORATION

Interview transcripts were coded using the major categories and related sub-dimensions from Thomas, Hocevar, and Jansen's collaborative capacity model.[82] The major categories, which are detailed in Chapter II, include Purpose and Strategy, Structure, Lateral Mechanisms, Incentives, and People. Underlying each category are forces that affect the collaborative capacity of an organization.

Table 1 provides a frequency count of the enablers mentioned by the senior managers interviewed for this study. Across the top of the table each of the five dimensions are identified and down the left-hand side are the assigned numbers for the senior managers. A dot in a column shows that a particular category was mentioned by a specific senior manager. For example, Senior Manager #1 discussed all five of the dimensions during the interview. Each column shows the number of times each dimension was expressed and the percentage of participants that identified themes within the specific dimension. For example, in the dimension of Purpose and Strategy, nine (or 90%) of the senior managers identified enabling factors that would contribute to collaboration. Looking across Table 1 Purpose/Strategy and Lateral Mechanisms were mentioned most frequently. Incentives and People/Processes were mentioned second most frequently. And, structure was mentioned by only 50% of the senior managers.

Under each category or dimension is a list of the sub-themes identified under each main category. For instance, under Purpose and Strategy, "common goals," "felt need" and "meaningful purpose" were identified by the senior managers. Each of these sub-themes will be discussed later in this section along with managers' quotes as illustrations.

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82 Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 22-37.

Table 1.   Enabling Themes (Senior Managers).

Senior Managers		Purpose/Strategy	Structure	Lateral Mechanisms	Incentives	People
	1	●	●	●	●	●
	2		●	●		
	3	●	●	●	●	●
	4	●	●	●	●	●
	5	●		●	●	●
	6	●		●	●	●
	7	●		●		
	8	●	●	●	●	●
	9	●		●	●	●
	10	●			●	●
Total		**9**	**5**	**9**	**8**	**8**
Frequency of Occurrence %		**90**	**50**	**90**	**80**	**80**

Enabling Themes

A. **Purpose and Strategy**
-Meaningful Purpose
-Common Goals
-Felt Need

B. Structure
-Formal Policies
-Benchmarks (Standards)

C. Lateral Mechanisms
-Network Ties
-Social Capital
-Familiarity with Other Organizations

D. Incentives
-Resource-based

E. People
-Respect Others Expertise
-Appreciation of Benefits
-Experience and Skills

Table 2 provides the frequency count of enablers mentioned by the middle managers. A dot in a column shows that a particular category was mentioned by a specific middle manager. For example, Middle Manager #7 discussed all five of the dimensions during the interview. Each column shows the number of times each dimension was expressed and the percentage of participants that identified themes within the specific dimension. For example, in the dimension of Purpose and Strategy, ten (or 83%) of the middle managers identified enabling factors that would contribute to collaboration. Looking across Table 2, Purpose/Strategy and Lateral Mechanisms were mentioned most frequently. Structure and People were mentioned second most frequently. And, Incentives was mentioned by only 42% of the middle managers.

Under each category or dimension is a list of the sub-themes identified under each main category. For instance, under Purpose and Strategy, "meaningful purpose" and "common goals" were identified by the middle managers. Each of these sub-themes will be discussed later in this section along with managers' quotes as illustrations.

Table 2. Enabling Themes (Middle Managers).

Participants		Purpose/Strategy	Structure	Lateral Mechanisms	Incentives	People
	1	●	●	●		●
	2	●		●		●
	3	●	●	●		
	4	●	●	●		●
	5	●	●	●	●	
	6	●	●	●	●	
	7	●	●	●	●	●
	8	●				
	9				●	●
	10	●		●	●	
	11					●
	12	●	●	●		●
Total		**10**	**7**	**9**	**5**	**7**
Frequency of Occurrence %		**83**	**58**	**75**	**42**	**58**

Enabling Themes

A. Purpose and Strategy
-Meaningful Purpose
-Common Goals

B. Structure
-Role Clarity
-Formal Authorities

C. Lateral Mechanisms
-Network Ties
-Social Capital
-Familiarity with Other Organizations.

D. Incentives
-Resource- Based

E. People
-Respect Others Expertise
-Appreciation of Benefits

A comparison of the themes from senior managers and middle managers shows the unique perceptions that are characteristic of different management levels. The percentage of senior and middle managers comments show the importance among the

five dimensions. Both levels of management identified most frequently the enabling factors of Purpose/Strategy and Lateral Mechanisms (86% and 82% respectively). People (68%) and Incentives (59%), are the second most influential factors for collaboration. Overall, Structure had the least impact on the City of Mesa and interdependent sectors (by 55%).

The following sections in this chapter will be discussed in order of importance and use quotes from the managers to show how the dynamics of each sub-dimension enable collaboration.

1.   Purpose and Strategy

Ninety percent of the senior managers and 83% of the middle managers interviewed identified Purpose and Strategy as an enabler of collaborative capacity.

Overall, a common sub-dimension among senior and middle managers related to there being a "meaningful purpose" for collaborating. Collaborating just to collaborate was viewed as being a burden on the organizations, unless it was meaningful. One senior manager stated;

> We are the stakeholders and if we fail it is because we did not prepare accordingly. Before it becomes a federal issue it is a local issue. We do not need to plan for the same things as California. We just need to be the best at handling our threats. When an outside sector has a needed resource, then will there be a purpose to collaborate.[83]

The quote suggests that preparing for response and recovery actions has a meaningful purpose. Resources and "being the best at handling threats" makes collaboration meaningful to the individual sectors. A middle manager summed this up by stating, "We all share in this commitment because our customers are made up of our families, neighbors and friends. When an unforeseen event happens that stretches the limits of one department, others are there to assist."[84] The concept that we are stewards of

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[83] Senior Manager, in discussion with the author, January 2007.

[84] Middle Manager, in discussion with the author, January 2007.

community adds meaning to cross-sector collaboration. There is a responsibility that exists for ensuring that the infrastructure is resilient to attacks or natural disasters.

Another sub-dimension identified by senior and middle managers is "common goals." Common goals provide direction and commitment between members of a partnership during response and recovery actions. One senior manager stated,

> Integrating goals provides the expertise to help out different sectors for a specific need. Common goals support collaboration by enhancing the capacity to effectively interact in partnerships.[85]

Possessing the capacity to integrate the organization's goals with outside sectors would be essential for collaboration. This is substantiated through the statement provided by a middle manager, "Once all parties have an understanding of what is the end result or goal, consensus is typically a formality with a few accommodations."[86] Cross-sector collaboration involves agreeing on a purpose that belongs to them both collectively and individually.

Senior managers were the only group to stress importance of "felt need" as a requirement for the individual sectors to work together. This need or importance can arise from the lack of tangible resources (i.e., equipment and money), expertise, or human resources. One senior manager neatly summed this up as "Well I think necessity is always the mother of invention. And so when you have a common need or common goal you can rally a lot of people around that central theme."[87]

2. Lateral Mechanisms

If "Strategy and Purpose" is the cornerstone of collaboration, then lateral mechanisms hold it all together. Overall, senior and middle managers identified (by 90% and 75% respectively) the importance this dimension has on the capacity to collaborate. So what is to be gained by strengthening this element of collaboration? As one senior manager put it we "need to understand the strengths and weaknesses of the groups so we

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[85] Senior Manager, in discussion with the author, January 2007.

[86] Middle Manager, in discussion with the author, January 2007.

[87] Senior Manager, in discussion with the author, January 2007.

know what they can and cannot do. So you can see if you need to build upon those areas and avoid triplication of efforts."[88] Once the organizations understand what each other "bring to the table" there are mechanisms that can facilitate mitigating the gaps. One middle manager summarized this nicely by stating "as a Utility, I think we have a lot of work to do. I think we can improve communication, planning, and response to an actual incident that may occur within the city. We need planning on what everyone's function would be in case of an incident."[89] Both levels of management defined "network ties," "social capital," and "familiarity with other organizations" as being the major underlying sub-dimensions that enable collaboration.

Knowing what channels to use for acquiring expertise or resources will depend on "network ties." The product of these ties could be as simple as an established contact list. The capability of an organization to effectively respond to a disaster could be dependent on such a list. The ties between organizations can be formal arrangements or informal. Interactions are a big factor in developing any network tie. One senior manager touches on this by stating, "Daily interactions begin developing the network for future partnerships. The outcome of these interactions can affect the individual and will dictate whether collaboration will occur."[90] This perception was also held by middle managers and summarized in the following statement,

> Informal networks work best at my level. "If you scratch my back, I will scratch yours." We learn who, within and outside the organization, can be entrusted to help out during times of need. To help build a collaborative relationship, I will provide assistance to you with hopes that when I need your assistance, it will be available. One great way to build relationships is training and education. Arizona State University's onsite degree program was the single best means for developing the network. If nothing else was gained through this program, it was the relationships that I established and maintain today.[91]

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[88] Senior Manager, in discussion with the author, January 2007.

[89] Middle Manager, in discussion with the author, January 2007.

[90] Senior Manager, in discussion with the author, January 2007.

[91] Middle Manager, in discussion with the author, January 2007.

From this quote the value of network ties between the City of Mesa and interdependent sectors can be assessed. Having the capacity for developing a network and sustaining these ties relate to "social capital."

Social capital is formally or informally acquired through interpersonal networks It is defined by the actions, experience and network ties that an individual exhibits during interactions with each other or outside sectors. Despite this difference in perceptions, both levels express the importance of social capital for enabling collaboration. One senior manager stated, "There is social capital to be gained by working with others and sharing information. This capital is what will enable us to call on help during a time of significant need."[92] Coming from a middle manager standpoint, the development of social capital is something they take seriously. One middle manager stated,

> Absolutely, I spend a lot of time interacting with others just so I can rely on them when I need them. That is something I make part of my job. I have established myself over the years with most of the city's departments and divisions. They trust my judgment, and I trust theirs. We work together to get everyone back on line.[93]

From these quotes it could be suggested that without social capital the infrastructure's resiliency would be threatened. Social capital can also impact the ability to become "familiar with other organizations."

Familiarity with other organizations can increase the effectiveness of the response and recovery efforts. Getting to know what an organization brings to the table and the impacts to that organization during an event could ease the initial burden of assessing a disaster area. Middle managers may not consider this as important since they interact more frequently among themselves and outside sectors. Where as senior managers tend to interact less frequently and would perceive familiarity as more important. One middle manager puts this into perspective by stating,

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[92] Senior Manager, in discussion with the author, January 2007.

[93] Middle Manager, in discussion with the author, January 2007.

EOC exercises typically involve upper management. Exercises held at the first responder level would add to building these networks. Working through issues with others and realizing what they bring to the table would carry over into real life incidents.[94]

Here the quote suggests that senior manager's involvement tends to occur in the Emergency Operations Center. In the City of Mesa, these exercises typically occur only once or twice a year. Therefore, familiarity with other organizations would be crucial to support first responders. One senior manager's perception coincides with this by stating, "Nothing like getting half-way through an incident and trying to figure out what someone can bring to the table. Instead of scrambling be proactive we tend to be reactive in a situation like that."[95] So familiarity can increase the capacity to collaborate with outside sectors.

3.   People

The underlying factors of this dimension are trust and respect. The common sub-dimensions identified by senior and middle managers relate to these factors. Both levels of management (80% of senior managers and 58% of middle managers) identified "respect other's expertise" and "appreciation of benefits" as enabling forces of collaboration.

"Respecting others expertise" was one common theme identified by senior and middle mangers. This could be specific to the amount of interactions each management level is involved. For example, middle managers rely more on social interactions to meet their goals. One middle manager puts this into perspective by stating, "We all have experiences and lessons learned that could be utilized during a time of need. The ability to accept differing opinions is critical."[96] Respecting other's expertise will also allow for the sharing of experiences to impact response and recovery actions. One senior manager stated, "Focus on a specific objective and work together. Through this we can instill a

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[94] Middle Manager, in discussion with the author, January 2007.

[95] Senior Manager, in discussion with the author, January 2007.

[96] Middle Manager, in a discussion with the author, January 2007.

variety of experiences across work functions."[97] This cross pollination will establish respect for the expertise of each member of the organization.

People of the collaborating organizations appreciate the benefits of partnerships. Senior and middle managers identified the importance of this sub-dimension. Even though there was a marginal difference in the frequency of occurrence between management levels, both recognized the importance of cross-sector collaboration. A senior manager describes this importance by stating, "Everyone has a stake in preparedness. Emergency response is a factor of how prepared we are to work with outside organizations."[98] Recognizing the importance of working with others can impact each collaborating partner. A middle manager sums this up by stating, "Internally we each take away something from collaborating."[99] This quote suggests that people can benefit from the interactions that occur when collaborating.

Finally, senior managers (by 40%) exclusively identified "experience" as being important for collaboration. Exercises and training can impact the experiences partners have interacting with others. The more partners interact with each other will dictate how well they understand each other. One senior manager elaborates on the importance of experience by stating, "It all depends on the working relationship we have with that organization to determine what we could do to help out."[100] Motivating people to begin these types of interactions will be the challenge. Transitioning an organization's culture towards effective homeland security will require a commitment beyond that which currently exists. Furthermore, the audit would not be objective if the negative forces against collaboration were not considered.

4.   Incentives

Incentives are directed at both individual and organizational gain. An organization's incentive policies require that members trust one another and work

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[97] Senior Manager, in a discussion with the author, January 2007.

[98] Ibid.

[99] Middle Manager, in a discussion with the author, January 2007.

[100] Senior Manager, in a discussion with the author, January 2007.

together. Successful collaborative efforts help spread costs and share risks. Every organization strives to increase efficiency and leverage capabilities across partners. Despite the rewards for collaborating, senior and middle managers viewed the importance of this sub-dimension significantly differently. The difference in frequency could be attributed to the budgetary responsibilities of senior managers opposed to middle mangers. From another perspective, middle managers may view incentives as being less important because there aren't currently reward systems in place in participating organizations in regard to collaboration activities. Overall, the comments of senior and middle managers were related to the sub-dimension of "resource-based" incentives.

Sharing resources whether that includes equipment, manpower, or technical expertise is beneficial. Resource-based incentives accounted for 71% of all middle manager responses. Considering that this level will be initiating response actions at the scene of a disaster, this could be expected. One middle manager states;

> We got the resources, and you got the manpower. Let's work together. Collaboration allows the success for all to receive acknowledgement and recognition in pursuing the common goal of achieving the desired outcome. With each drop of water comes an ocean of possibilities.[101]

Of course, resources can create competition as one senior level manager states "Effective use of labor and technological resources, cost savings, reduction of downtime and avoidance of adverse operational impacts makes collaboration essential."[102] An obvious incentive for working together is increasing the response capabilities without having to encumber redundant equipment and personnel. Collaboration serves as a "force multiplier" between sectors, because collectively organizations have adequate resources.

In addition, senior managers exclusively identified (by 40%) incentives themselves as being important. Incentives can enable collaboration but can also create competition between organizations. One senior manager summed this up in their statement, "As an individual you are competing with others and preventing others from

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[101] Middle Manager, in discussion with the author, January 2007.

[102] Senior Manager, in discussion with the author, January 2007.

obtaining their goals. But by cooperating you both can achieve the individual goals. Cooperation creates a win-win situation."[103] Incentives can enable collaborative efforts by the positive reinforcement of rewards (monetary and cost savings). The mechanisms for providing incentives need to exist and can be influenced to some extent by the next dimension.

5. Structure

The senior and middle managers (50% or more) identified the underlying sub-dimensions that are characteristic of this dimension. This dimension focuses on the formal mechanisms that shape how the organization conducts business and interacts with other agencies. The common themes that were identified by senior and middle managers differed but this could be indicative of responsibilities of the specific levels of management. Besides the fact that "Structure" was mentioned least among senior managers, two common themes came out of the interviews.

First, the importance of "Structure" itself was identified by senior managers. One senior manager stated, "Just like building blocks, you need a foundation in order to build a structure. Comprehensive issues require comprehensive solutions."[104] Structure not only provides a foundation from which to interact but establishes a mechanism for governing the interactions. A senior manager sums this up by stating, "For cross-sector collaboration to work, some form of governance needs to exist to ensure all interests are addressed."[105] This quote suggests that governance enables collaboration to occur by providing a structure that engages all partners. Formal policies and benchmarks aid in establishing this structure or form of governance for collaboration to occur.

Formal policies provide an institutional structure from which interactions can be governed. Formal policies could include mutual aid agreements, memos of understanding, operation plans and continuity of operations plans. Formal policies and procedures are imperative to defining the boundaries and roles of individual

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[103] Senior Manager, in discussion with the author, January 2007.

[104] Senior Manager, interview by author, Mesa, AZ, January 2007.

[105] Ibid.

organizations during a disaster response and/or recovery. One senior manager stated "we are governed by regulations that require us to maintain reliability and accountability."[106] While another senior manager stated, "Most interactions with other utilities are handled through Mutual Aid Agreements, but minimal interaction during normal operations."[107] From these viewpoints "formal policies" help provide a framework for the City of Mesa and interdependent sectors to interact. These policies were important to middle managers.

The common themes that were identified by middle managers are directly related to the "formal policies" generated by senior managers. The common sub-dimensions identified by middle managers included "role clarity" and "formal authority." One middle manager was able to define the relationship between policies and role clarity by stating, "We are the catalyst, or conduit for the sector's collaborative efforts. Regardless of whom you are and what utility you represent, we need to understand each other's policies and roles during a response to have consensus."[108] The sub-dimension of "formal authority" directly relates to the delegation of decision making through policy and procedures. One member of middle management felt that this made an impact on collaboration by stating, "I know that my direct supervisor entrusts me to make decisions whether it involves dispersing resources or requesting them."[109] The capacity to make timely decisions without having to pass everything through senior management increases collaboration.

Increasing collaboration through the use of benchmarks (standards) can establish a set of commonly practiced procedures to ensure continuity among and between infrastructure sectors. The perception of one senior manager indicated that this sub-dimension was very important for collaboration. This can be derived from the statement, "Actions taken by responsible parties actually form a benchmark for the industry, a standard that government entities can incorporate in policy and legislation. When service is lost we need to be able to rely on a specific standard of support."[110] Acknowledging a

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[106] Senior Manager, interview by author, Mesa, AZ, January 2007.

[107] Ibid.

[108] Middle Manager, interview by author, Mesa, AZ, January 2007.

[109] Ibid.

[110] Senior Manager, interview by author, Mesa, AZ, January 2007.

specific benchmark provides a performance measure that can be expected and evaluated. Knowing what resources and services will be rendered upon request could increase the capacity to collaborate.

C.   BARRIERS INHIBITING COLLABORATION

In addition to the positive forces exerting pressure on an organization to change, there will be negative forces against change. In general, it has been difficult for the water sector to transition into the broad scope of homeland security. Interview transcripts were coded using the major categories and related sub-dimensions from Thomas, Hocevar and Jansen's collaborative capacity model.[111] The major categories include Purpose and Strategy, Structure, Lateral Mechanisms, Incentives, and People. Underlying each category are forces that negatively affect the collaborative capacity of an organization.

Table 3 provides a frequency count of the barriers mentioned by the senior managers interviewed for this study. Across the top of the table each of the five dimensions are identified and down the left-hand side are the assigned numbers for the senior managers. A dot in a column shows that a particular category was mentioned by a specific senior manager. For example, Senior Managers #7 and #9 discussed all five of the dimensions during the interview. Each column shows the number of times each dimension was expressed and the percentage of participants that identified themes within the specific dimension. For example, in the dimension of Structure, eight (or 80%) of the senior managers identified disabling factors that would inhibit collaboration. Looking across Table 3 Structure and People were mentioned most frequently. Purpose and Strategy and Lateral Mechanisms were mentioned second most frequently. And, Incentives was mentioned by only 30% of the senior managers.

Under each category or dimension is a list of the sub-themes identified under each main category. For instance, under Lateral Mechanisms, "lack of social capital," "no meaningful purpose" and "divergent goals" were identified by the senior managers. Each of these sub-themes will be discussed later in this section along with managers' quotes as illustrations.

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[111] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 22-37.

Table 3.   Disabling Themes (Senior Managers).

Participants		Purpose/Strategy	Structure	Lateral Mechanisms	Incentives	People
	1	●				●
	2					
	3	●	●			
	4	●	●			●
	5		●	●	●	●
	6	●	●	●		●
	7	●	●	●	●	●
	8		●			●
	9	●	●	●	●	●
	10	●	●	●		●
Total		7	8	5	3	8
Frequency of Occurrence %		70	80	50	30	80

Disabling (Barriers) Themes

A. **Purpose and Strategy**	**B. Structure**	**C. Lateral Mechanisms**
-No Felt Need	-Lack of Horizontal Teams	-Lack of Social Capital
-No Meaningful Purpose	-Imposed Policies	-Lack of Network Ties
-Divergent Goals	-Lack of Formal Roles	

D. Incentives   **E. People**

-Lack of Trust
-Lack of Appreciation of others

Table 4 provides the frequency count of barriers mentioned by the middle managers. A dot in a column shows that a particular category was mentioned by a specific middle manager. For example, Middle Manager #4 and #11 discussed four of the five dimensions during the interview. Each column shows the number of times each dimension was expressed and the percentage of participants that identified themes within the specific dimension. For example, in the dimension of People, ten (or 83%) of the middle managers identified disabling factors that would inhibit collaboration. Looking across Table 4, People and Structure was mentioned most frequently. Purpose/Strategy and Lateral Mechanisms were mentioned second most frequently. And, Incentives was mentioned by only 33% of the middle managers.

Under each category or dimension is a list of the sub-themes identified under each main category. For instance, under Lateral Mechanisms, "lack of social capital" was identified by the middle managers. Each of these sub-themes will be discussed later in this section along with managers' quotes as illustrations.

Table 4.   Disabling Themes (Middle Managers).

		Purpose/Strategy	Structure	Lateral Mechanisms	Incentives	People
Participants	1		●	●		●
	2	●	●			●
	3	●	●			●
	4	●	●	●		●
	5		●		●	●
	6		●	●		
	7		●			●
	8	●				●
	9	●		●	●	●
	10		●		●	●
	11		●	●	●	●
	12					
Total		**5**	**9**	**4**	**5**	**10**
Frequency of Occurrence %		**42**	**75**	**42**	**33**	**83**

Disabling (Barriers) Themes

A. Purpose and Strategy
-No Felt Need
-No Meaningful Purpose
-Divergent Goals

B. Structure
-Lack of Vertical Integration
-Lack of Role Clarity
-Lack of Flexibility

C. Lateral Mechanisms
-Lack of Social Capital

D. Incentives
-Resource Based

E. People
-Lack of Trust
-Lack of Appreciation of Others

A comparison of the themes from senior managers and middle managers shows the unique perceptions that are characteristic of different management levels. The percentage of senior and middle managers discussing certain factors show the influence among the five dimensions. Both levels of management identified the barriers of People

and Structure (82% and 77% respectively). Purpose/Strategy (55%) and Lateral Mechanisms (41%) are the second most disabling factors for collaboration. Overall, Incentives had the least impact (36%) on the City of Mesa and interdependent sectors.

The following sections in this chapter will be discussed in order of importance and use quotes from the managers to show how the dynamics of each sub-dimension can impede collaboration.

1. People

Overall, the two levels of management elaborated more on this dimension than the other four dimensions. Senior (by 80%) and middle (by 83%) managers identified several underlying sub-dimensions that would act as a barrier to collaboration. The "lack of trust" and the "lack of appreciation of others" were the two most common themes. The problem with interconnected sectors is that there is a tendency to disregard that everyone has a stake in homeland security. This can be associated to mistrust. One senior manager pointed this out by stating,

> There is always a tendency to not want to work together. I do not know why that is. There is just this lack of trust that we are doing this for a genuine reason. There is some perverted reason out there that people are trying to do something to get the upper hand. That prevents us from collaborating. In a capitalist society this is difficult. There is a lack of cooperation if there is mistrust, 'why is the fire department on the scene?' 'why is utilities involved?' or 'what do they want?'. There is not a deep level of trust.[112]

The lack of trust can come as much from what people don't know as much as what they do know. A middle manager reflects on their experience with this sub-dimension by stating, "The senior manager was not trusting of the other sections and departments. Felt there was always a hidden agenda when others wanted to work together."[113] Without organizational trust it will be difficult to appreciate the other sectors.

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[112] Senior Manager, in discussion with the author, January 2007.

[113] Middle Manager, in discussion with the author, January 2007.

The sub-dimension "lack of appreciation of others" is also influenced by mistrust. A senior manager elaborates on their experiences by stating, "Some of this has to do with personalities and personal agendas. People trying to move up the management ladder regardless of whose back you stepped on."[114] From this quote it is easy to sense that an individual's personal motives could influence their appreciation of others. A middle manager touches on this from their perspective by stating, "We have seen where other divisions consider their tasks to be more important than ours. Until they begin to appreciate our needs, there will be no collaboration."[115] From this quote, middle managers view this sub-dimension as influencing the division or organization rather than on the individual level.

2. Structure

The interview data indicates that senior (by 80%) and middle (by 75%) associated certain underlying sub-dimensions of "Structure" as barriers to collaboration. At first glance, it would appear that barriers senior managers identified are different than the barriers of middle managers. However, the two sets of sub-dimensions are actually tied together and reflect the perceptions and experiences of each level of management. For example, middle managers identified that "lack of role clarity" and senior managers identified "lack of formal roles" can in fact inhibit collaboration. The relationship between these two sub-dimensions starts to surface in the statement of one middle manager. "We still do not have a grasp on how we fit into NIMS, so maintaining the same management philosophies will continue keeping us from understanding how to work within this structure."[116] This quote summarizes the perceptions other middle managers. The perception of their role could be affected by the lack of management's direction (lack of formal roles). A senior manager recognized this connection by stating,

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[114] Senior Manager, in discussion with the author, January 2007.

[115] Middle Manager, in discussion with the author, January 2007.

[116] Ibid.

Goes back to how ridiculous is NIMS, what role and responsibilities will utilities have? We will look like the "keystone cops" without formalized roles.[117]

Without formalized roles, each member will not understand what they offer to the situation (role clarity).

Another example of the relationship between the barriers identified by senior and middle mangers in this dimension is the factors of "imposed policies" and "lack of flexibility." Seniors managers elaborated on the negative influences that policies could have on collaboration. One senior manager stated, "Imposed policies and agendas will undermine the "need" or "value" to collaborate."[118] From this quote it is clear that imposing a policy among or between sectors could create a negative interaction. Policies can also limit the capability of responders. This relationship is clarified by a middle manager in the statement, "We all have our own roles and responsibilities, until we are directed to begin identifying how we all affect one another it will not effectively occur."[119] This statement captures the perceptions of four middle managers and shows how the direction of senior managers could enable or discourage collaboration.

In the context of structure the "lack of horizontal teams" was identified by senior managers and the "lack of vertical integration" was identified by middle management. Both of these sub-dimensions were perceived to negatively influence collaboration. Even though these themes would appear to be completely separate, they are related. At the senior management level, the common perception was focused on the absence of horizontal mechanisms impeding collaboration. A senior manager elaborates on this by stating, "We need to tear down "silos" before we can work together."[120] In this statement, the individual divisions or infrastructure sectors would need to counteract the forces resisting change. The "silos" are typically established by senior management to maintain stability in their organization. Stability or the resistance to change impacts the sub-

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[117] Senior Manager, in discussion with the author, January 2007.

[118] Ibid.

[119] Middle Manager, in discussion with the author, January 2007.

[120] Senior Manager, in discussion with the author, January 2007.

dimension related to vertical integration. Middle managers viewed the lack of vertical integration as a barrier to cross-sector collaboration. A middle manager sums this up by stating,

> The issue is that we are so big and segmented. People have their own agendas and when you come together on something big, like a terrorist act, the common goal is to maintain the integrity of the system and Mesa's reputation. You got to work through so many levels, that there does not seem to be a sense of ownership.[121]

This quote helps illustrate how internally the structure of an organization can impact the ability to work with others. Senior and middle manager perceptions can be viewed as being influenced by each other. Working across sectors will be difficult if the separate organizations can not vertically work together. Collaboration would need support from both levels of management.

3. Purpose and Strategy

Despite the fact that senior and middle managers acknowledge cross-sector collaboration is important for responding and recovering from emergencies, barriers exist that influence these interactions. Senior (by 70%) and middle (by 42%) identified common barriers in the context of "purpose and strategy." Overall, three common sub-dimensions emerge from the interview transcripts. These barriers to collaboration are "no felt need," "no meaningful purpose," and "divergent goals."

Both senior and middle managers agreed that a sense of "need" would impact collaboration. Without a "felt need" to engage other sectors, members would be hesitant to work together. One senior manager elaborates on this sub-dimension by stating, "We have not had a need to collaborate."[122] This quote comes from personal experience and characterizes how this specific barrier could inhibit collaboration. One middle manager elaborates on this in the statement, "There is generally always consensus as to the nature of the problem. As for the resolution to the problem, this is where we lack a felt need."[123]

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[121] Middle Manager, in discussion with the author, January 2007.

[122] Senior Manager, in discussion with the author, January 2007.

[123] Middle Manager, in discussion with the author, January 2007.

Attempting to resolve a problem independently takes away from a collective effort, especially if the problem affects interdependent sectors.

Lacking a sense of need tied into the second commonly mentioned barrier. "No meaningful purpose" was identified by senior and middle managers. If there is no need to collaborate, how could there be a purpose for working together? One senior manager associates the ties between these two barriers to resources in the statement, "Large companies tend to have the budgets, staffs, and willingness to implement plans as necessary. Collaboration becomes limited as the need diminishes, there will be no purpose to work together."[124] This quote presents an interesting viewpoint in that the more sustainable an organization becomes, the less likely they would collaborate with other sectors. A middle manager gets to the point in the statement, "working together just to do it would not be beneficial to the whole."[125] In summary, without a "felt need" whether that comes from the lack of equipment, money, or labor; there could be no purpose for collaborating.

Another barrier that could stress working relationships is "divergent goals." Senior and middle mangers elaborated on how this sub-dimension would affect cross-sector collaboration. A senior manager helps understand this inhibiting factor by stating "Our individual agendas may place different levels of urgency for this preparedness. If my self interest aligns with your self interest than we will probably cooperate and we will have that opportunity. On the other hand if our self interests are in diversion or competition then less cooperation will occur within an organization."[126] Divergent goals are not the only culprits that make collaboration difficult, but they can make collaboration difficult. A middle manager summarizes their experiences with divergent goals in the statement, "It is about what is best for them, not the City. We need to have a common set of goals to achieve collaboration."[127] Therefore, the capacity to collaborate could be negatively influenced by the barriers of this dimension.

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[124] Senior Manager, in discussion with the author, January 2007.

[125] Middle Manager, in discussion with the author, January 2007.

[126] Senior Manager, in discussion with the author, January 2007.

[127] Middle Manager, in discussion with the author, January 2007.

4.   Lateral Mechanisms

Overall, senior (by 50%) and middle (by 42%) managers agreed that underlying sub-dimensions of lateral mechanisms could be barriers to cross-sector collaboration. Both levels of management elaborated that without social capital, getting the disparate sectors to collaborate will be difficult. The bond that connects these organizations together is very delicate and cannot be written into procedures. One middle manager stated, "Past interactions, mainly bad, tend to diminish the ability to work together."[128] Although "lateral mechanisms" can include informal networks and random interactions, credibility needs to be fostered and maintained. Cross-sector collaboration is not a "one size fits all" model but a dynamic, evolving process that will change from one organization to another. One senior manager summarizes this by saying "Government has to have some measure of establishing legitimacy to maintain cooperation of all the agencies and the community. Without credibility, no one would follow and there would be disorganization."[129] Overall, building "social capital" and establishing "network ties" take a commitment of time and resources.

The lack of network ties was identified mostly by senior managers. Senior managers identified the impacts of failing to establish network ties. A senior manager stated, "If these ties are not established beforehand, obtaining help during a disaster is almost impossible."[130] From this quote, the importance of network ties can not be underrated and possessing a limited capacity of this sub-dimension would limit collaboration.

5.   Incentives

The interviews identified that senior (by 30%) and middle (by 42%) perceived sub-dimensions of "incentives" to be barriers to collaboration. Overall, senior managers did not identify a common sub-dimension that inhibits collaboration. Three themes were

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[128] Middle Manager, in discussion with the author, January 2007.

[129] Senior Manager, in discussion with the author, January 2007.

[130] Ibid.

each identified by one participant. These included: "No incentive," "lack of experience" and "history of Competition." "History of Competition" was also identified by a single middle manager.

Resources (e.g., equipment) and money are generally the two components that can be incentives to collaborate or cause competition between organizations. Three middle managers identified "resource-based" incentives as a barrier. An interesting viewpoint that came out of the interviews and was shared by one middle manager was as follows:

> If you are well funded, staffed and equipped, the value of collaboration decreases. Example, if I had the equipment and manpower to perform my own repairs, I would not collaborate with the water division as much as we do.[131]

From this quote there appears to be a dichotomy with this sub-dimension. Resource-based incentives are viewed as both enablers and as barriers. Exclusive to each factor, is the influence of money. "We will work together to share costs" or "we have more than enough money and do not need to collaborate."

D.   CONCLUSION

Interviewing the two levels of management helped understand the current set of factors (enabling or barriers) that influence the individual sector's decision to engage in one interaction over an alternative interaction. Analyzing the interview transcripts provided this research with results to begin framing the perceptions and experiences of senior and middle managers. In addition, the interviews provided an environment for getting the participants to begin thinking about cross-sector collaboration.

All of the results were used to populate the survey instrument with questions from the *Collaborative Capacity Audit* item bank. Where differences existed between the levels of management, questions were selected to collect additional data to explain these occurrences. In addition, the dimensions (e.g., Incentives and Structure) where there was minimal input of senior and middle managers, questions were selected to get the

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[131] Middle Manager, in discussion with the author, January 2007.

participants thinking within the context of these dimensions. The dimensions that were important (strong emphasis) for both levels of management, questions were selected to capture data of these strengths and weaknesses in the City of Mesa and interdependent sectors.

V. SURVEY FINDINGS

A. INTRODUCTION

The results of the thematic analysis of the initial interviews provided the direction for selecting questions from the "Database of Questions" developed by Thomas, Hocevar, and Jansen.[132] The Survey was distributed to the senior and middle managers of the City of Mesa's utilities and interdependent sectors. In all, there were ten senior managers and thirteen middle managers. All twenty-three of the participants returned their completed surveys and the results were tabulated in an Excel database. The results of the survey are found in Appendix D. This chapter first discusses the overall results of the survey. A more detailed examination of five specific findings is then presented. These findings were used to solicit participant feedback on results representative of the five domains identified in the Diagnostic Model.[133] The "Response Form" summarized five findings in an e-mail distributed to participants. One form was provided for each of the five findings and one additional form was provided for any additional findings on which the participant wanted to comment. The goals of the response form were to solicit the participant's reactions to the specific findings and ask for their recommendations. This process allowed the participant an opportunity to provide their interpretation of the data and recommendations to improve cross-sector collaboration within the City the Mesa.

Consistent with the model, findings are grouped by the specific dimensions (e.g., Purpose and Strategy, Structure, Lateral Mechanisms, Incentives, and People. The following sections start with a presentation of the results with interpretation through eyes of the author followed by a summary of participants' interpretations and recommendations.

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[132] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 37-47.

[133] Ibid., 19-21.

B. OVERALL FINDINGS

The overall findings of the survey provide a "snapshot" of the current collaborative strengths and weaknesses that exist between Mesa's utilities and the interdependent sectors. The survey was designed with a four point scale, where a neutral mean value (e.g., 2.5) is neither strong nor weak. For the purposes of analysis eleven negatively worded questions were recoded for comparability with the positively worded questions. For example, a negatively worded question that had a mean value of 4 would be recoded to reflect a mean value of 1. The survey questions having a higher mean value (e.g., >2.5) show positive capabilities in the context of collaborative capacity, where a lower mean value (e.g., <2.5) show negative or weaker capabilities.

On the strong side, eleven questions had a mean value greater than neutral (mean > 2.5). Of these eleven questions, the mean values to six questions are equal to or greater than 2.7. In other words, these six questions (Table 5) identified areas where Mesa and the interdependent sectors possess stronger collaborative capabilities. These strengths fall into four of the five domains of the *Collaborative Capacity Audit*, with the two strongest factors being in the dimensions "Lateral Mechanisms" and "People." The participants identified technical interoperability (question #19) and recognizing the importance of working with other agencies (question #28) being their areas of greatest strength. But, given the ratings were on a four-point scale, these means (3.2 and 2.9, respectively) suggest there is still room for improvement in these areas. A full list of the survey's questions and results can be found in Appendix D.

Table 5.   Strengths in Collaboration

Question	Mean
4. My organization recognizes the importance of working with other sectors to achieve an outcome.	2.9
16. Employees who work with other sectors know whom to contact in those agencies for information or decisions.	2.7
19. My organization has the technical interoperability to enable effective cross-sector collaboration.	3.2
23. We gain savings in training costs by collaborating with other agencies.	2.8
28. People in my organization recognize the importance of working with other sectors to achieve an outcome.	3.0
32. Members of my organization respect the expertise of those in other organizations with whom we have to work.	2.8

Considering collaborative weaknesses, sixteen questions had a mean value less than neutral or 2.5. Of these sixteen questions, the means to eleven questions are less than a mean value of 2.3. These eleven capabilities span all five domains of the *Collaborative Capacity Audit,* with five of the ten questions coming from the dimension of "Lateral Mechanisms." Two of the weakest capabilities were identified from this dimension (Lateral Mechanisms) and one from "Incentives." Specific to lateral mechanisms, the participants reported that Mesa and the interdependent sectors did not invest enough time and resources to become familiar with each other (question #11) and leadership did not commit time and resources to combined training (question #15). Specific to incentives, the participants identified that a history of competition affects cross-sector collaboration (question #21). The following table identifies the weaknesses or barriers that exhibit the greatest influence on Mesa and the interdependent sectors.

Table 6.   Weaknesses in Collaboration

Question	Mean
1. Our organizational leaders often meet and confer with the leaders of other agencies about cross-sector collaboration.	2.3
2. Cross-sector (e.g., water, electric, and gas) collaboration is a high priority for my organization.	2.2
7. My organization lacks formal roles that support effective cross-sector collaboration.	2.9 (2.1)*
9. My organization has strong norms that encourage cross-sector collaboration.	2.1
10. My organization has strong norms for learning from others.	2.2
11. My organization invests time and resources to become familiar with the capabilities and requirements of the organizations with which we might work.	2.0
15. My leadership commits their time and our resources to combined training with other sectors.	2.0
17. My organization works with other sectors or agencies to identify lessons learned for improved collaboration.	2.2
21. A history of competition and conflict affects our cross-sector capability.	3.0 (2.0)*
25. I have adequate time to invest in the requirements for collaboration.	2.3
31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.	2.3

*The mean value was recoded for comparability.

The findings are intended to provide a mechanism to begin dialogue between the sectors. Toward that end, five findings from the overall results of the survey were chosen to start this dialogue. The participants were asked to provide their own interpretations of the data and recommendations for increasing capabilities in the specific dimensions. In addition, the participants were asked to provide feedback on any results not discussed in the five findings. Findings soliciting input reflected results for the total set of participants as well as comparisons of middle and senior managers.

C.   PURPOSE AND STRATEGY

Four questions were selected from the *Collaborative Capacity Audit Database,* to gain the perceptions of senior and middle managers. The results of the questions are summarized in Table 7. For ease of comparison, "Strongly Agree" was combined with

"Agree" responses and presented as "Percentage Agree." The results of the survey identified agreement and divergence between senior and middle managers within the sub-dimension of purpose and strategy.

Looking at the data there appears to be disagreement between senior and middle managers as to frequency that leadership in Mesa and interdependent sectors meet and confer with each other. Middle managers agreed (by 54%) that leaders meet with other agencies to improve collaboration. However, senior managers were not as confident that this interaction occurred on a regular basis. This finding could indicate that middle management does not have an understanding of the interactions that occur between senior management and outside sectors or that senior management does not communicated the lack of interactions.

Another key finding is the comparison of the responses to questions two and four. Question two asks whether interagency collaboration is a high priority for the organization and question four asks if the organization recognizes the importance of working with other agencies to achieve an outcome. Almost half of the middle managers agreed that interagency collaboration is a priority and 69% agree their organizations recognize it is important to work with other agencies to achieve an outcome. The results of the survey identified 90% of senior managers "Agree" with the importance of working with other sectors. However, senior managers unanimously (100%) "Disagree" that collaboration is a high priority for the organization.

Furthermore, the influence that specialized or unique sector requirements have on existing cross-sector interactions was the focus for question three. Seventy percent of senior managers either agreed or strongly agreed that the organization's unique requirements make cross-sector collaboration difficult; while only 15% of middle managers agreed or strongly agreed with this statement. Due to the obvious contrast in results, these two findings were incorporated into the "Response Form" to provide each participant the opportunity to provide feedback on these findings. Questions are highlighted where interpretation from participants was determined to be essential and included on the "Response Form."

Table 7.   Purpose and Strategy.

Question	Percentage Agree*		
	Senior (n=10)	Middle (n=13)	Total (n=23)
1. Our organizational leaders often meet and confer with the leaders of other agencies about cross-sector collaboration.	20%	54%	39%
2. Cross-sector (e.g., water, electric, and gas) collaboration is a high priority for my organization.	0%	46%	26%
3. Because of my organization's unique requirements, I find it difficult to engage in cross-sector collaboration.	70%	15%	39%
4. My organization recognizes the importance of working with other sectors to achieve an outcome.	90%	69%	78%

1.   Participant Interpretations

The senior and middle managers provided their feedback on the two findings identified by the author. Of the twenty-three participants, only eleven "Response Forms" were returned. Based on the responses, five of the participants describe senior and middle managers as having different priorities as a result of their role-specific experience with collaboration (questions #2 and #3). One respondent's comment illustrates:

> Senior managers tend to work at the senior level in collaboration. In my opinion this type of collaboration tends to be more of a power struggle or making sure that we have control over whatever the issue might be. As the chain of command goes down, I feel the acceptance of relying on the other organization's knowledge goes up. The lower levels of management tend to interact with their counterparts at various conferences, meetings, and community issues giving them a common goal to work towards allowing everyone to succeed. Often because the senior management does not get along with other senior level managers from other entities, the lower manager is left to work harder to maintain good working relationships and positive collaborations. Doing so increases the communication and willingness to compromise for the sake of saving the collaborative relationship.[134]

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[134] Statement by participant on the "Response Form," June 2007.

From this statement and related comments, delineation between senior and middle manager responsibilities begin to emerge. Senior managers are focused on maintaining the sustainability of the organization and thus find themselves in competition or power conflicts. Middle managers are left to ensure the continuation of essential functions and thus tend to interact more frequently with outside agencies to ensure the goals of the organization are achieved.

In addition to distinctive level-specific responsibilities, three of the respondents' identified "communication breakdowns" and three respondents' indicated "money" as contributing to an explanation of the results of the survey. Regarding "communication breakdowns" one respondent stated, "Senior management does not get along with other senior level managers from other entities; the middle manager is left to work harder to maintain good working relationships and positive collaborations."[135] In addition, when resources (money) are at stake one respondent stated,

> We all know that it is important to work with other sectors. The big problem is resources to accomplish this. Because of budget constraints there are not sufficient amounts of people or money to make this a high priority. Therefore we have to accomplish any collaboration on an as needed basis.[136]

Therefore, the lack of resources could negatively influence collaboration (barrier). Allocating people and equipment to collaborative activities involves money. This could have an impact on how each of the two levels of management view their priority to collaborate.

Feedback was also received on the second topic (question #3) of the impact of "unique requirements of collaboration." Through "division of labor" each sector specializes in the services that they provide.[137] Mesa's Electric Utility has "linemen" that are specialized to work on power lines that distribute electricity and the Water Utility has operators that specialize in providing potable drinking water. How can these individual

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[135] Statement by participant on the "Response Form," June 2007.

[136] Ibid.

[137] Emile Durkheim, *The Division of Labor in Society,* ed. George Simpson (Glencoe, IL: The Free Press of Glencoe, 1960): 40-55.

sectors offer support to each other during a crisis? Based on interpretations of eleven participants, five of the participants identified a similar theme. This theme centered on the interactions between the levels of management dependent on the level of responsibility and accountability. In essence, working toward a "common goal" can be impeded by the individual's position in management. One respondent puts this in a clear perspective by stating:

> Many of the middle managers have worked with their counterparts either at previous jobs or in collaborative organizations that bring together all municipalities. These gatherings encourage the commonality of all participants, no matter how the departments are set up. It encourages communication and again allows middle managers to find a common ground with their counterparts in other cities. Once managers are able to find common ground, no matter how different the job title may be, they understand how collaboration will benefit both parties.[138]

Middle managers seem to retain "unique" specialization while also accomplishing necessary collaboration. Regarding senior managers, it would appear that because of their level in the organization their perception differs. One respondent puts this into perspective by stating,

> Most likely, the differences reflect the scope of responsibilities of the two groups. The more senior the manager, the more global their view of priorities becomes. While working together is important, collaboration may not necessarily rank high relative to the multitude of other priorities.[139]

Aside from the theme of interactions being different between levels of management, additional themes were identified by the remaining respondents. These themes included divergent goals and cross-sector training. Regarding "divergent goals" one of the four respondents provided an interpretation that merits acknowledgement:

> Divergent goals don't inhibit collaboration between organizations, only possible outcomes. The devil is in the details. Everyone wants security in a networked environment. The goals of one sector may be ultimate security while another sector wants maximum usability. These goals are conflicting

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[138] Statement by participant on the "Response Form," June 2007.

[139] Ibid.

and cannot be satisfied on either side. This is where flexibility is more important than one size fits all. The collaboration is in the sharing of the risks involved in the decision.[140]

Being flexible to each other's needs is critical for collaboration. So how do two specialized sectors provide a benefit during a response scenario? Cross sector training was viewed by two of the participants as being a mechanism to get Mesa and the interdependent sectors to recognize the benefits of collaboration. As described, "I think cross-sector training is important as an industry. Though individual specialized training is vital to ensure adequate and properly skilled staff, getting to see the whole picture can be very beneficial."[141] Regardless of whether the first responder is a "lineman" or "water operator," there are interdependencies that link the two together. Working as a team can decrease the effect of an incident and increase the resiliency of both essential services.

2. Participant Recommendations

All twenty-three participants were given the opportunity to make recommendations related to the findings described above that could improve the organization's capacity to collaborate. Only eleven participants chose to provide recommendations. Regarding collaboration as a priority to the organization, two recommendations were each identified by three participants. These recommendations involve more communication between the levels of management within a given sector organization as well as across sectors; and also the need for more cross-sector training to open the interactions between Mesa and interdependent sectors. In the context of communication, one respondent replied, "senior management may need to reevaluate their response and possibly communicate with their staff on their use of collaboration. This may allow the organizational structure to foster a collaborative effort environment."[142] From this comment, communication between levels of management

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[140] Statement by participant on the "Response Form," June 2007.

[141] Ibid.

[142] Ibid.

could start the dialogue for improving collaboration. This relates to the second recommendation regarding cross-sector training. One respondent stated:

> Although our senior managers would contend they can, and do communicate cross-sectorally, an exchange of resources and equipment (collaboration) does not easily exist. Exercises or mock situation drills should be conducted to explore whether or not it could/or would work. Once this effort is done, one could further examine what worked well, what didn't and then devise a plan to resolve these issues.[143]

So training could improve communications and increase the priority for collaborating through identifying the strengths and weaknesses of Mesa's utilities and interdependent sectors. Aside from these two themes, three other recommendations were provided. These were to get more interaction between senior management and middle management regarding collaboration; to develop a plan of action for collaboration; and to get the Finance Department involved in securing monies for collaboration. Of these three recommendations, acquiring money was touched on by two participants.

In addition, the participants provided recommendations for reducing the impacts of divergent goals. Of the eleven recommendations submitted for this sub-dimension, two themes were each identified by four of the participants. One theme involves improving senior manager's "understanding" of collaboration. Understanding what to communicate is definitely a component for reducing the influence of specialized services. One respondent's recommendation sums this up by stating, "The findings misinterpret the data. Divergent goals don't inhibit collaboration, they just prevent consensus. Management needs to recognize that consensus is not necessarily a desired outcome. The desired outcome is a fully vetted solution."[144] This statement truly identifies the root of the problem in the dimension of Purpose and Strategy. The individual sectors do not necessarily have to give up unique requirements and goals, but they need to acknowledge where interdependencies require collaboration.

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[143] Statement by participant on the "Response Form," June 2007.

[144] Ibid.

The second recommendation endorsed by four of the participants involves training. In some aspects, the recommendations foresee training as an instrument to gain more understanding of cross-sectoral issues and getting the levels of management to loosen up to each other. One respondent summarizes this by stating,

> The best way to solve all of the above issues is to remove the silos. I know the city manager's office is attempting this but not at the necessary levels. Managers do not know everything and are not always right. Training is required if any plan is going to work.[145]

Two other themes were identified by two participants each; these focus on improving cross-sectoral "understanding" and establishing direction and improving communications between management across sectors. While these can result from training, they were seen by these respondents as separate recommendations for improving collaboration.

D.   STRUCTURE

In the dimension of "Structure" the results of the survey describe how the participants viewed formal policies and procedures and roles and responsibilities within Mesa and the interdependent sectors. The data presented in Table 8 illustrates how each of the structural factors influences the capacity to engage in cross-sector collaboration. Conflicting policies can make collaboration less effective for both levels of management. For question six, 60% of senior managers and 54% of middle mangers agree that conflicting policies have a negative influence on collaboration among interdependent sectors. However, there is some disagreement between the two levels of management as to whether their organizations possess the willingness to adapt procedures (question #5). Only 30% of senior managers agree that that their organization is willing to adapt procedures to meet requirements of outside organizations, while 62% of middle managers view their organization's capability to adapt procedures more favorably. Definitely, there needs to be a willingness to adapt the policies or procedures that impede relational improvements. Possessing the flexibility and adaptability are important factors to increase the effectiveness of cross-sectoral collaboration.

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[145] Statement by participant on the "Response Form," June 2007.

Interestingly, senior managers agreed (question #7) that their organization lacks formal roles that support effective cross-sector collaboration (90%). A similar finding is that only 30% of senior managers agree that effective cross-divisional collaboration occurs within their organizations (question #8). Middle managers give a similar pattern of responses, but less extreme (62% and 54% respectively). What this might mean is if cross-divisional collaboration is not commonly practiced within sector organizations in Mesa, it may be difficult to develop this capability across the organizations.

Table 8.   Structure.

Question	Percentage Agree*		
	Senior (n=10)	Middle (n=13)	Total (n=23)
5. My organization is willing to adapt procedures to meet the requirements of outside organizations with which we might work.	30%	62%	48%
6. Conflicting organizational policies make collaboration very difficult for my organization.	60%	54%	57%
7. My organization lacks formal roles that support effective cross-sector collaboration.	90%	62%	74%
8. Effective cross-divisional collaboration occurs within my organization.	30%	54%	43%

E.   LATERAL MECHANISMS

The results of the thematic analysis of interviews (see Chapter IV) revealed that both senior and middle managers recognize the positive effects lateral mechanisms have on collaboration. Since sub-dimensions of this dimension of the *Collaborative Capacity* model were mentioned most frequently by participants, eleven questions were placed on the survey.[146] As reflected in Table 9, the results identify that there was general agreement across levels of management on two aspects of lateral mechanisms. For question #19 there was 83% overall agreement that the organization possesses technical interoperability; 74% agree that members of their organization have knowledge of whom

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146 Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity*, 41-42.

to contact (in other organizations) in the event of an emergency (question #16). These two findings show evidence of the important capability of both technical and social network ties.

However, it does appear that senior and middle managers disagree on the implications existing processes have on their organization (question #13). Only 8% of middle managers agree that processes are too rigid for effective collaboration. This is a small minority in comparison to half of senior managers who agreed that organizational processes are indeed too rigid. These findings could be reflective of the different working environments in which each management level resides.

The summary of the thematic analysis of initial interviews identified common themes among the participants regarding factors that affect collaboration. A few of these themes were "social capital" and "familiarity with other organizations." Looking at the results for question #18, half of the overall participants agree that people are taking initiative to build relationships with other organizations. However, only 26% of the total set of participants' agreed that the organization invests time and resources to "become familiar with the capabilities and requirements of the organizations with which we might work" (question #11). Familiarity could be gained through "combined training and exercises," but the results indicate that only 26% agree that leadership invests time and resources to training with other sectors. The results substantiate this with only 22% of all participants agreeing that the organization has strong norms that encourage cross-sector collaboration. Questions are highlighted where interpretation from participants was determined to be essential and thus were included on the "Response Form."

Table 9.   Lateral Mechanisms

Question	Percentage Agree*		
	Senior (n=10)	Middle (n=13)	Total (n=23)
9. My organization has strong norms that encourage cross-sector collaboration.	10%	31%	22%
10. My organization has strong norms for learning from others.	40%	23%	30%
11. My organization invests time and resources to become familiar with the capabilities and requirements of the organizations with which we might work.	20%	31%	26%
12. My organization is responsive to the requirements of other organizations with which we work.	40%	85%	65%
13. My organizational processes are too rigid and don't enable me to work effectively with other organizations.	50%	8%	26%
14. My organization provides adequate access by other sectors to information we have that is relevant to their work.	40%	77%	61%
15. My leadership commits their time and our resources to combined training with other sectors.	10%	39%	26%
16. Employees who work with other sectors know whom to contact in those agencies for information or decisions.	90%	62%	74%
17. My organization works with other sectors or agencies to identify lessons learned for improved collaboration.	30%	31%	30%
18. In my organization, people take the initiative to build relationships with other organizations.	50%	54%	51%
19. My organization has the technical interoperability to enable effective cross-sector collaboration.	70%	92%	83%

1.   Participant Interpretations

The eleven participants provided feedback to the results of question #15 and one theme was similar across the responses of five participants. The context of this theme focused on money or resources. All the participants are exposed to technical and sector-specific training and workshops. However, a perceived lack of resources affects the pursuit of combined training as a priority. One of the respondents shared this sentiment by stating:

This is more a matter of resources availability rather than commitment to a cause or issue. It gets down to prioritizing resources and what managers believe is the highest and best use of those resources. As indicated earlier, collaboration is not the highest priority among senior managers.[147]

From this statement it could be understood that there is an emphasis on efficiency and reductions in spending capital that influence managerial decisions. These results-driven factors could produce the negative forces that influence the City of Mesa's capacity to collaborate. Although training can increase costs, through collaborative efforts an incentive would be shared costs. But the sectors would need to possess the capital for their share of the costs. One of the respondents touched on this subject,

This particular finding is dependent on two items, the organizations willingness to train and the budget to train. The finding indicates that both levels agree training is important and both agree that there isn't enough training being done. However, in a municipality this can be dictated by the budget not the individual managers' belief. If the budget could include more training both levels would take advantage of it because both levels understand how it can benefit the organization."[148]

It might be possible to use the managerial goals of efficiency and fiscal savings as motivators if cross-sector training activities could be undertaken through cost-sharing. The allocation of resources and a commitment to engage in joint training could increase the interaction between organizations.

Another related theme was similarly discussed by four participants. This theme implicated that cross-sector training is a matter of balancing the positive and negative factors on the organization. One respondent stated,

The lack of an organizational training program requires that managers focus whatever funds that are available for training to their specific needs. Training, though very worthwhile and necessary to the success of the organization is costly. Therefore, managers must wrestle with the benefits

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[147] Statement by participant on the "Response Form," June 2007.

[148] Statement by participant on the "Response Form," June 2007.

to having a collaborative training effort that may or may not suit their needs vs. a separate training effort designed to meet their individual needs.[149]

Therefore, budgetary constraints could have an impact on the organization's priorities for training and collaboration.

In addition to financial allocations, other themes were identified from participant feedback as contributing to collaboration. These themes included: communication between management levels (one participant) and cross-sector training is not relevant (one participant).

2.   Participant Recommendations

Participants made recommendations related to the findings described above that could increase the commitment of management towards combined training. A theme identified by seven of the participants focused on committing more of the budget to training. These recommendations were all similar in content, as one respondent put it "find the funds and get a commitment from management to start a training program."[150]

The participants identified five additional themes for increasing the commitment of time and resources for combined training. These four recommendations were each identified by one participant and included forming a team to assess training needs; specific training on collaboration; recognizing the demands on each sector; start small and then work towards larger combined efforts. One of the five recommendations was identified by two participants. This recommendation focused on leadership. One respondent stated, "In order to increase the opportunities and schedule training sessions as a collaborative effort, leadership needs to encourage participation (collaboratively)." Leadership has the capability to actively support an initiative and allow that to permeate through the organization.

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[149] Statement by participant on the "Response Form," June 2007.

[150] Ibid..

F. INCENTIVES (MOTIVATION AND LEADERSHIP)

This section describes respondents' ratings of factors that elaborate on the dimension of "Incentives." The results of the survey identify that several factors are in motion for and against collaboration. Only 39% of participants agreed that they have adequate time to invest in collaboration (question #25). While not a majority, 43% of participants agree that they have a system to capture lessons learned to increase collaboration skills. This is a mechanism for building collaborative capabilities (Question #20).

Considering the effects that "competition" can have on collaboration, the results of question #21 identify that overall senior and middle managers agree (78%) that competition is problematic. A lower percentage (39%) agrees that their organization is viewed as a competitor by potential partners (question #24), though this includes 50% of senior managers. However, there is evidence of successful collaboration (question #22) in that over half of the total participants identified that their organization works well with other agencies. The data for question #23 substantiates that 65% of senior and middle management acknowledge they gain savings in training costs by collaborating with other agencies. Based on these data, perceptions about resources can be an enabler and barrier for collaboration. This is an interesting finding and was incorporated into the final stage of data collection. The feedback from the participants provides more in-depth interpretation and recommendations on this issue. Questions are highlighted where interpretation from participants was determined to be essential and included on the "Response Form."

Table 10.　Incentives.

Question	Percentage Agree*		
	Senior (n=10)	**Middle (n=13)**	**Total (n=23)**
20. My organization captures lessons learned to increase our collaboration skills.	**40%**	**46%**	**43%**
21. A history of competition and conflict affects our cross-sector capability.	**90%**	**69%**	**78%**
22. My organization has a history of working well with other sectors.	**40%**	**61%**	**51%**
23. We gain savings in training costs by collaborating with other agencies.	**80%**	**54%**	**65%**
24. Potential collaborative partners often view my organization as competitors.	**50%**	**31%**	**39%**
25. I have adequate time to invest in the requirements for collaboration.	**30%**	**46%**	**39%**

1.　Participant Interpretations

Eleven "response forms" were received and only three provided feedback related to "cost savings" (question #23). Two of the participants interpreted the findings to represent the benefit of combined training. However, one respondent did not interpret the results in this context:

> I interpret this as a serious lack of resources and desire to collaborate. If we had a desire we would pool resources and make it happen. We all have enough resources to get the daily tasks accomplished. If not, we know who to call to get help for that specific need. We do not need additional resources just to collaborate or we would have resources sitting around decaying. In an emergency, collectively we have a lot of resources to take care of the problems.[151]

Given the results, as well as the limited but mixed feedback, further discussion is needed in Mesa as to whether additional resources are needed to achieve cross-sector collaboration or if a process is needed to facilitate combining existing resources for some

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[151] Statement by participant on the "Response Form," June 2007.

interdependent activities (like training). This was an interesting assessment of collaboration. Too often, agencies hold on to the government "token ring" for homeland security grant monies.

2. Participant Recommendations

Within the domain of "Incentives" only two of the eleven respondents recommended policy changes for providing incentives to collaborate. Incentives can motivate both levels of management to interact with other sectors more frequently. Encouraging these interactions can facilitate frequent interactions with outside sectors and increase the capacity to collaborate. This is an example of the impacts that combined training could have on the organization. One recommendation stated, "Those involved in security and disaster planning, as well as those in management need to compromise and recognize that combined training is a valuable and efficient means to the end."[152] There needs to be an incentive for providing resources.

G. PEOPLE

In the context of "People and People Processes" the results of the survey show that there was general agreement between senior and middle management of the collaborative strengths. Specifically, participants report that people in their organizations respect the expertise of those in other organizations (#32, 83% agreement). Similarly, both senior and middle managers feel their organization's members recognize the importance of working with other sectors to achieve an outcome (#28, 91% agreement). Finally, the participants agreed (65%) that their organizations are aware of the capabilities of agencies they work with (#29).

However, Table 11 identifies differences between senior and middle managers perceptions regarding some barriers of collaboration. Senior managers tended to agree (60%) that people in the organization have no energy to work with other organizations (#27) while only 8% of middle managers agreed with this. The forces that are present to

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[152] Statement by participant on the "Response Form," June 2007.

account for this difference could explain why senior and middle managers were on opposite ends of the spectrum on several other related questions. When asked if the participants face incompatible requirements (#33), senior managers agreed (70%) with this being a barrier to collaboration. Middle managers did not perceive this to as big of a barrier (31%). Finally, trust is a major component of any relationship. Senior managers agreed (70%) that the organization tends to be suspicious and distrustful of other organizations (#35). Given the more competitive role responsibilities of senior managers described in the discussion of earlier findings (see section on Strategy and Purpose), this may be expected; but middle managers only agreed (23%) that distrust was a problem. Two findings were selected from this domain and presented to the participants for interpretation and recommendations.

The first finding solicits feedback on the influence working experience has on the suspicions and distrust of the organizational members (questions #34 and #35). The second finding from the dimension of "people" involves obtaining feedback on the role of respecting the expertise of other organizations has on the capability to share decision-making authority (questions #31 and #32). These questions are highlighted in Table 11 for ease of comparison.

Table 11. People

Question	Percentage Agree*		
	Senior (n=10)	Middle (n=13)	Total (n=23)
26. My organization has a history of cross-sector competition.	70%	46%	57%
27. People in my organization have no energy for collaborating with those in other organizations.	60%	8%	30%
28. People in my organization recognize the importance of working with other sectors to achieve an outcome.	100%	85%	91%
29. Members of my organization are aware of the capabilities of other organizations with which we work.	50%	77%	65%
30. People in my organization have a positive attitude toward collaboration with other organizations.	50%	46%	48%
31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.	30%	54%	43%
32. Members of my organization respect the expertise of those in other organizations with whom we have to work.	90%	77%	83%
33. When working on cross-sector issues, I often face incompatible requirements or requests.	70%	31%	48%
34. Employees from my organization are not used to working with people from other organizations and find it hard to do so.	80%	15%	43%
35. People in my organization tend to be suspicious and distrustful of counterparts in other organizations.	70%	23%	43%

1.   **Participant Interpretations**

In the context of "People," eleven participants provided feedback to the first finding (#31 and #32). Overall, 83% of participants report that members of their organizations respect the expertise of their counterparts in outside sectors. However, a lower percentage (43%) agreed the members were willing to share decision making. Six themes came out of the participant feedback, one of which was similarly discussed by six participants. This theme involved how the different perspectives of management are dependent on their level in the organization. One respondent stated,

> Senior management feels the need for more control of decision-making within their sectors. This is a natural response in this type of position. Middle management is used to being in the "middle" of upper management and field workers, looking out for both sides.[153]

So, responsibilities and accountability increase as the level of management goes up, but the willingness to collaborate may go down as a result of these responsibilities.

Additional interpretations were each identified by one participant. These themes included: the influence of leadership on collaboration; lack of awareness and divergent goals.

Furthermore, two other themes were identified in the "response forms" that were each discussed by two participants. These included "silos impede collaboration," and "competition for resources will lower the value to collaborate." Of these two themes, one participant blends the effects of each theme into his/her statement:

> The organization is segregated into several diverse groups. Each group respects the competence and expertise of the others. Although, operating in a competitive environment creates competition for limited resources. This type of environment makes embracing the philosophy of collaboration very difficult.[154]

The next group of findings relate to the competition created by maintaining sectoral silos.

Feedback was also received about the finding that 43% agreement that people are not used to working with outside sectors (#34) and people tend to be suspicious and distrustful of counterparts in other organizations (#35). Again there were six themes identified by the participants. Four responses concentrated on one theme, relating to how senior managers lack an understanding of existing processes or capabilities of the lower levels in the organization. An interesting viewpoint was expressed by one of the respondents:

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[153] Statement by participant on the "Response Form," June 2007.

[154] Ibid.

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It appears that senior managers are speculating about the ability of employees to adapt and work with each other. I mention speculation because it can only be assumed because we rarely have the opportunity to collaborate together on various projects or exercises that would prove otherwise."[155]

This theme would seem imply that senior managers are detached from the interactions occurring at lower levels, but the next theme explains how "the different levels complement each other." This theme was identified by three of the participants and is illustrated by one respondent's statement:

It appears to me that senior managers' opinions are based on the political world they work. Senior managers spend their days trying to keep an organization intact and functioning while being stripped of resources by other departments within the city. Middle managers are basically sheltered by senior managers and are much closer to the everyday working world Spending more time working with others along with their staff and having a different perspective on collaboration.[156]

This theme suggests that senior managers and middle managers view their working relationships with other sectors differently. It is not necessarily that senior managers block collaboration but that they have different perspectives of what is a priority to the organization. Their focus is on sustaining their organization and fulfilling organizational requirements. It is their responsibility to provide the resources for middle management to reach beyond organizational boundaries. The nuances of the remaining interpretations centered on senior management's fear of losing control; the need for more communication between management levels; lack of results and distrust is linked to the limited amount of time spent working together hampering collaboration. Separate themes collectively provide a lens for which to see the deficiencies in capacity and areas for improvement.

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[155] Statement by participant on the "Response Form," June 2007.

[156] Ibid.

2. Participant Recommendations

The recommendations for reducing the barriers of decision making and respecting the expertise of other sectors (#31 and #32) were just as enlightening as the interpretations. Eleven participants returned their "response forms" which identified six recommendations. Of these six recommendations, one theme was similarly discussed by four participants. The communication between senior and middle managers needs to be improved, as described by one participant:

> For senior level managers to have more communication with lower management within the same organization to fully understand the effects non collaboration on one issue can have on the overall success of the entire organization and increase the communications of senior level management into the outside sectors.[157]

This theme suggests that before communications can improve with outside sectors it has to occur internally.

Additional themes were each provided by one participant. These themes involved: creating an open environment and providing incentives for collaboration; reducing competition; senior managers need training on collaboration; conduct more joint exercises; and one respondent was satisfied with the status quo. One person's comment captured several recommendations by stating,

> Cross-section collaboration only requires shared decision making on issues that affect the organization as a whole. Decisions affecting only one sector need not be concerned with shared decision making. The collaboration effort is still valuable in providing the decision maker with enough information in order to make informed decisions.[158]

The implications of this quote would suggest that the goal of collaboration is not to necessarily have consensus decision making. Managers do not have to give up their decision authority, but there is value to be gained from the input of relevant others to make better informed decisions.

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[157] Statement by participant on the "Response Form," June 2007.

[158] Ibid.

Clarifying the expectations for improving interactions and developing a "game-plan" for making this happen is critical for success. The individual organizations will not be able to sustain a capacity to collaborate without a cognitive effort to reaffirm relationships and address suspicions. Participants provided feedback on how to address this (questions #34 and #35). One theme was similarly expressed by four of the eleven participants. This theme involved opening dialogue between the two levels of management and outside sectors. One respondent touches on a solution by stating,

> For senior level managers to have more communication with lower management within the same organization to fully understand the effects non collaboration on one issue can have on the overall success of the entire organization. In addition, increase communication across senior level management in the outside sectors.[159]

Collaboration requires actions, whether these actions include meetings or training there is a physical effort implied in these interactions. As the old cliché states, "actions speak louder than words."

Additional themes were each identified by two participants. These themes included setting objectives for collaboration and developing strong leadership for improving collaboration. One respondent was able to meld these two themes together by stating,

> Collaboration is only valuable if the outcome of the process is beneficial to all concerned. Often this is not the case. Collaboration has been more information gathering than results oriented. This is caused by the lack of project management skills present during the onset of the collaboration. Collaborations are mini-projects. They need to have a clearly defined scope, which should include expected outcomes. It should also include what is expected of its member organizations.[160]

Senior leadership can establish the strategy for which middle managers set operational objectives to meet these goals. These strategies can reduce cross-sector suspicions by promoting collaboration.

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[159] Statement by participant on the "Response Form," June 2007.

[160] Ibid.

Finally, two themes were independently identified by participants. These themes included setting up a method for senior management to work along side middle managers to gain an appreciation of the cross-sector interactions, and conduct joint exercises to build trust and knowledge of Mesa utilities and interdependent sectors.

H.   SUMMARY

The quantitative results provided one method for summarizing the existing perceptions within the five domains of the *Collaborative Capacity Audit.* However, numbers do not provide insight into the individual experiences that each participant uses to assess the world around them. The qualitative results substantiated the statistical data and provided a means to elaborate the enabling and restrictive factors. Obtaining the support of both senior and middle management in this research was critical for assessing the City of Mesa's capacity to collaborate. Already, there has been positive feedback as a result of the initial interviews and survey that suggests the participants are beginning to think more about collaboration.

Some of the substantive findings that came out of the survey interpretations involved training. Training is essential because of the multiple linkages between the City of Mesa and interconnected sectors. Combined training or exercises can expose weaknesses in the response capabilities and open a window of opportunity to fill these gaps. Opening communications between senior and middle managers was another substantive finding. From the participant feedback there is a lack of awareness stemming from senior and middle managers not communicating. Senior management will not understand the extent of collaboration between Mesa and the interdependent sectors without sharing information vertically and horizontally through the organization.

VI. CONCLUSION AND RECOMMENDATIONS

A. INTRODUCTION

This nation relies on a network of critical infrastructures to maintain economic superiority, public health, and military strength. The terrorist attacks of 9/11 are examples of the types of disasters that can impact the essential services we take for granted. These disasters begin locally but have the capability of impacting entire regions or the nation. Under this premise, the federal government established the National Infrastructure Protection Plan (NIPP). The plan's cornerstone is collaborative partnerships.[161] However, this national strategy failed to recognize whether the independent sectors had the capacity to engage in collaboration. The NIPP thrust new responsibilities and focused additional attention onto the infrastructure sectors. The central argument that was presented is that the "hodge-podge" of existing efforts to strengthen critical infrastructure are not enough. There remains a lack of capability to assess the capacity of organizations to collaboration.

The water sector provides an example of how the individual infrastructures are attempting to align with the provisions of the NIPP. The implementation of water and wastewater agency response networks (WARN) signifies the attempts of the water sector to internalize collaborative efforts. However, since the inception of the WARN concept in 1992, only six water agency response networks have been established.[162] If collaboration makes perfect sense, why does it seem so difficult for even one sector to establish partnerships? Thomas, Hocevar, and Jansen hypothesize that organizations vary in their capacity to collaborate.[163] This research recruited the participation of the City of Mesa's utilities and interdependent sectors to diagnose their Collaborative Capacity. This chapter

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[161] Stephan, "National Infrastructure Protection Plan Represents Collaboration between Government and Private Sector," 2.

[162] Kevin Morley and Ray Riordan, *Utilities Helping Utilities: An Action Plan for Mutual Aid and Assistance Networks for Water and Wastewater Utilities* (Denver, CO: American Water Works Association, March 2006): 35. http://www.awwa.org/Advocacy/Govtaff/Documents/Utilities_Helping_Utilities.pdf [Accessed February 12, 2007).

[163] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity in an Interagency Context*, 2.

discusses the factors for and against collaboration that currently exist in the City of Mesa and interdependent sectors. Understanding these factors allows the organization to begin thinking about how it might increase its collaborative capacity. This discussion is followed by short-term and long-term recommendations for increasing Mesa's capacity to collaborate.

B.   CURRENT FACTORS INFLUENCING COLLABORATION

Many obstacles, such as denial and lack of trust, can plague an organization and complicate cross-sector planning and response. Initiating dialogue with the key stakeholders in critical infrastructure protection was the first step in this case study. Using the *Collaborative Capacity* model to assess the City of Mesa utilities and interdependent sectors, the results of this survey provide a portrait of the specific enabling and inhibiting factors that influence their capacity to collaborate. Although no uniform patterns of barriers and enablers were identified between the senior and mid-level managers, this chapter summarizes the most prominent barriers and enablers. Nuances in the differences and details that exist between the different enablers and barriers are explained in greater detail in Chapters IV and V.

This study was designed to examine the factors that inhibit and enable collaborative capacity for the City of Mesa and the related sectors. Both qualitative and quantitative data were collected from ten senior management and thirteen mid-level managers to answer the first two research questions.

1.   What Factors are Inhibiting the Agencies from Collaborating?

The qualitative data captured from initial interviews of senior and middle managers identify the common themes that inhibit collaboration among the City of Mesa utilities and interdependent sectors. The barriers that the participants determined to have the greatest negative influence on the organizations were "People" and "Structure." Both levels of management identified more challenges in the dimension of "People" than the other four dimensions. Senior (by 80%) and middle (by 83%) managers identified several underlying sub-dimensions that can act as barriers to collaboration. "Lack of trust" and

"lack of appreciation of others" was the two most common themes. This may illustrate a problem with interconnected sectors if there is a tendency to disregard others' stake in homeland security.

Similarly, "structure" was identified as an inhibiting factor. The interview data indicate that senior (by 80%) and middle (by 75%) managers associate certain underlying sub-dimensions of structure as barriers to collaboration. Senior managers identified that "lack of horizontal integration," "imposed policies" and "lack of formal roles" as inhibiters to collaboration. In addition, middle managers identified that "lack of vertical integration," "lack of role clarity" and "lack of flexibility" impeded their ability to collaborate. At first glance, it would appear that barriers senior managers identified are different than the barriers of middle managers. However, the two sets of sub-dimensions are actually tied together and reflect the perceptions and experiences of each level of management.

The quantitative results from the follow-on survey provide another lens with which to focus on the factors inhibiting collaboration. The results displayed in Chapter V show that sixteen of the survey questions had a mean value less than neutral or 2.5. Of these sixteen questions, eleven survey questions had a mean value less than 2.3. Two of the weakest capabilities (mean value of 2.0) were identified from the dimension "Lateral Mechanisms" and one from "Incentives." Specific to lateral mechanisms, the participants reported that Mesa and the interdependent sectors did not invest enough time and resources to become familiar with each other, and leadership did not commit time and resources to combined training. Specific to incentives, the participants identified that a history of competition affects cross-sector collaboration.

In summary, the combined results of the qualitative and quantitative analyses provide answers for what specific weaknesses or barriers have the greatest influence on the City of Mesa utilities and the interdependent sectors.

2. What Factors are Present that Would Enable These Agencies to Collaborate?

The qualitative data captured from initial interviews of senior and middle managers identify the common themes that enable collaboration among the City of Mesa utilities and interdependent sectors. The enabling factors that had the greatest influence on the participating organizations were found in the dimensions of "Purpose and Strategy" and "Lateral Mechanisms." In the dimension of purpose and strategy ninety percent of the senior managers and 83% of the middle managers interviewed identified Purpose and Strategy as an enabler of collaborative capacity. Overall, a common sub-dimension among senior and middle managers related to there being a "meaningful purpose" for collaborating. Collaborating just to collaborate was viewed as being a burden on the organizations, unless it was meaningful. Another sub-dimension identified by senior and middle managers is "common goals." Common goals provide direction and commitment between members of a partnership during response and recovery actions.

In the dimension of lateral mechanisms, senior and middle managers identified (by 90% and 75% respectively) the importance this dimension has on the capacity to collaborate. Participants acknowledged that "social trust," "network ties" and "familiarity with other organizations" drive collaboration. Considering "network ties," the capability of an organization to effectively respond to a disaster could be dependent on this network. The ties between organizations can be formal arrangements or informal. Interactions are a big factor in developing any network tie.

The results of the *Collaborative Capacity survey* provide additional insight into the enabling factors that influence Mesa's utilities and interdependent sectors. The quantitative data identify several collaborative strengths. Eleven questions had a mean value greater than neutral (mean > 2.5). Of these eleven questions, the mean values to six questions were equal to or greater than 2.7. In other words, these six questions identified areas where Mesa and the interdependent sectors possess stronger collaborative capabilities. These strengths fall into four of the five domains of the *Collaborative Capacity Audit*, with the two strongest factors being in the dimensions "Lateral Mechanisms" and "People." The participants identified technical interoperability (mean

value of 3.2) and recognizing the importance of working with other agencies (mean value of 3.0) being their organization's areas greatest strength.

Overall, these data reflect that, despite the existing enabling forces, there also exist numerous opposing forces. Even within an organization, initiating a shift towards homeland security can be a difficult process.

> The Department of Homeland Security's National Infrastructure Protection Plan recognizes this, but nonetheless, boldly calls for a broad range of partnerships. Not surprisingly, each of the seventeen sector-specific plans also calls for such partnerships, although at the sector scale, the nature and scope of these partnerships varies considerably from one sector to the next.[164]

The first step towards change is identifying the forces that influence collaborative capacity (enablers and barriers). Only then can the organization focus on reducing the barriers or increasing the enabling forces. The results of the "thematic analysis" of interviews and the *Collaborative Capacity Audit* captured the perceptions of senior and middle level management. Overall, the results provide a "snapshot" of the organizational strengths and weaknesses. Furthermore, a summary of the qualitative and quantitative results reveal some inconsistencies that will need to be discussed in further detail in follow-on meetings with the City of Mesa and the interdependent sectors. Working through and identifying these inconsistencies would be a necessary step toward increasing the capacity to collaborate.

C. PLANNING FOR TRANSITION

An organization's culture develops over time and is deeply rooted in held values. In *Organizational Character,* Bridges attempts to identify the character traits that account for an organization's resistance to change.[165] Unfortunately, changing an organization's character is a long and difficult process. Identifying the influences (e.g., enablers and barriers) that these "personality traits" exhibit on the capacity to collaborate will enable sector managers to take initiatives to improve Mesa's capability to achieve Homeland

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[164] Ware, *Challenges of the Partnership: Pulling Together the Public and Private Sectors*, 111-112.

[165] Bridges, *The Character of Organizations*.

Security critical infrastructure protection. Several forces continually operate to maintain this given culture. The failure to recognize the influence of these forces is described by Kim and Mauborgne as:

> A common mistake is to discuss changes in strategy before resolving differences of opinion about the current state of play. Another problem is that executives are often reluctant to accept the need for change; they may have a vested interest in the status quo.[166]

As seen in the summarized findings above the forces "for" or "against" change affect the organization's ability to interact with other sectors. These forces can create divergence between organizations and can also define the organizational strengths for collaboration.

The Collaborative Capacity Survey was populated with questions from the instrument developed by Thomas, Hocevar, and Jansen.[167] The survey results were used to begin a conversation among key organizational members as they considered ways to improve collaborative capacities between the City of Mesa utilities and interdependent sectors.

> The consolidation of change does not occur simply because change provides benefits. Change can feed on itself or, to use social science language, positive feedback can occur-because a movement in one direction sets in motion forces producing further movement in that direction.[168]

An important aspect to initiating a change in Mesa's collaborative capacity was to have the key participants engaged in the interpretation of results.

> Engagement means involving individuals in the strategic decisions that affect them by asking for their input and allowing them to refute the merits

[166] W. Chan Kim and Renee Mauborgne, *Blue Ocean Strategy* (Boston, MA: Harvard Business School Press, 2005), 84.

[167] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity in an Interagency Context*, 37-47.

[168] Steven Kelman. *Unleashing Change: A Study of Organizational renewal in Government* (Washington, DC: Brookings Institution Press, 2005): 7.

of one another's ideas and assumptions. Engagement results in better strategic decisions by management and greater commitment from all involved to execute those decisions.[169]

The participants provided interpretations that were generally expected and others that were not anticipated. One finding that was not expected is the acknowledgement of senior management's role in the organization. Senior managers can actually shield mid-level managers from the "turf battles" and indirectly provide the resources necessary to collaborate. This allows middle managers the capacity to engage in interactions with other sectors. All the interpretations are summarized in the previous chapter.

As reflected in the interpretations of findings, the City of Mesa and interdependent sectors recognize the need for "network ties." Networking was more prominent with the middle mangers, having a duty to maintain services and complete specialized tasks. The results indicate that the sectors respect the expertise of others, but are unwilling to share decisions. In all, the respondents know who to call but are less likely to alter their own activities.

A recent phone interview with Brandon Hardenbrook of the Pacific Northwest Economic Region brought to light an important factor in cross-sector collaboration. "The executive level of any organization is out to make money and sustain business. A collaborative effort has to be supported by upper management and built around middle managers to be effective."[170] These findings, along with the following discussions help answer the research question: *"What might be done to build their capacity to collaborate?"*

D.   SHORT-TERM RECOMMENDATIONS

The disparate sectors are called to step forward, creating a new way of working together. Indeed, even with the best intentions of operating as partners or teams, it is all too easy to revert to the old working environment. Along this line of thought, a Government Accounting Office report stated,

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[169] Kim and Mauborgne, *Blue Ocean Strategy*, 175.

[170] Brandon Hardenbrook, in discussion with the author, April 2007.

Agency missions that have evolved over time often have conflicting objectives that reflect different aspects of complex problems. This makes interagency coordination both more necessary and more difficult. Such difficulties are compounded when clear lines of responsibility and accountability for crosscutting program efforts are absent.[171]

The recommendations that were collected from the "Response Form" begin to lay this foundation for changing the City of Mesa's capacity to partner with other agencies. The eleven respondents who participated in this phase of the study identified factors that would theoretically decrease the influence of existing barriers.

Through empowerment, members of the organization can make decisions to interact with other agencies and assess those resource capabilities that beneficially could be "pooled." These factors fall into the "Structure" domain of the Collaborative Capacity Audit.[172] Furthermore, "pooling resources" shares value within the domains of "Structure" and "Incentives." The budgetary values for "pooling resources" are through shared costs and reimbursement, which can actually lower the costs to the partners. Overcoming the barrier of limited resources requires gaining senior management's approval. Developing the capacity to collaborate does not have to increase the need for resources.

Finally, the majority of the respondents recommended that senior and middle mangers participate in cross-sector training and exercises. Similarly, the results of a nationwide survey found that 38 of the 43 water experts (88 %) indicated that training and exercises were a priority and deserved federal funding.[173] Why is training so important? Personnel interactions occur and increased familiarity with other organizations results from joint training.

Developing the organization's capacity to collaborate is an effort that will take time and thought.. In a recent article, Hardenbrook states:

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[171] *Managing for Results: Barriers to Interagency Coordination,* 9.

[172] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity in an Interagency Context,* 23-24.

[173] *Drinking Water: Experts Views on How Federal Funding Can Best be Spent to Improve Security,* 15.

Partnerships require a level of cooperation not previously seen in past emergency management situations. Moreover, cross-sector relationships require slow and deliberate implementation. While no blueprint or plan exists describing how to create a regional partnership, much can be learned from past experiences and best practice examples.[174]

A short-term strategy for building the momentum of change should focus on the findings that were the most obvious or "low-hanging fruit." Based on the participant's recommendations, the City of Mesa and interdependent sectors need to be committed to taking the necessary steps and allocate the time needed to coordinate with sectors. When these results are achieved, the strategic plan needs to be revisited to determine the process towards institutionalizing collaboration.

Overall, the model dimensions and sub-dimensions provide an adequate framework for categorizing the survey findings and initiating dialogue.

E.   LONG-TERM RECOMMENDATIONS

The City of Mesa and interconnected sectors, each within their own areas of expertise, keep essential services functioning. However, collectively, these disparate sectors lack the capacity to effectively collaborate in achieving the long-term strategies of homeland security. In a recent Government Accountability Office Report, the heterogeneous characteristics of some sectors make collaboration and consensus on their plans a challenge.[175] Eleven senior and mid-level managers provided recommendations in the "Response Form" phase of this thesis research that can begin the process of change. The *Collaborative Capacity Survey*, found in Appendix D, provides results (from twenty-three managers) for supplemental long-term recommendations. These recommendations should be prioritized and institutionalized to "enhance the capacity of

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[174] Hardenbrook, "The Need for a Policy Framework to Develop Disaster Resilient Regions," 15.

[175] *Critical Infrastructure Protection: Progress Coordinating Government and Private Sector Efforts Varies by Sectors' Characteristics,* 8.

other sectors for mutual benefit and to achieve a common purpose," which are key to successful collaboration.[176] The following are recommendations for the City of Mesa and interdependent sectors.

1.   Leadership Support

Leadership has a significant role to play in preparing for and responding to a disaster because a natural disaster or terrorist attack could have an impact on the City of Mesa and interconnected sectors. "Hesitant leaders thus short-circuit both major elements of a hopeful view of the potential for successful frontline change. If leaders do not try to initiate change, supporters cannot be unleashed."[177] Although senior leadership support is needed to sustain change, this level of management may not be the best choice to represent the organization in a cross-sector collaborative.

Therefore, the City of Mesa needs to look for "champions" among the sectors to ensure there is a commitment to see this process into the future. "A successful collaborative often begins with one person who has the vision and drive to bring together different groups for a common purpose."[178] Bringing these individuals into the collaborative effort will gain the support of employees and start the momentum for changing the capacity to collaborate.

2.   Strong Norms

The domain of "lateral mechanisms" accounts for the establishment of strong norms being rooted in the culture of collaboration.[179] Strong organizational norms encourage cross-sector collaboration and enable the City of Mesa to share lessons learned and best practices. "Crafting the partnership organizational infrastructure and underlying trust generally requires a number of shared experiences to become robust. Part of the

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[176] Himmelman, "Devolution as an Experiment in Citizen Governance," 9-10.

[177] Kelman, *Unleashing Change: A Study of Organizational renewal in Government*, 9.

[178] Environmental Protection Agency, *Security Information Collaboratives: A Guide for Water Utilities* (Cincinnati, OH: Office of Research and Development, May 2005):6.

[179] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity in an Interagency Context*, 41.

partnership organizational infrastructure and norms should include concrete activities and processes to build ongoing personal relationships over time."[180] Partnerships will help the City of Mesa by leveraging the institutional knowledge and experiences of internal and external employees. Senior managers need to encourage employees to interact with outside sectors and provide a vehicle that would foster lessons-learned.

Essentially, the City of Mesa should interact with and work to educate interconnected sectors about water utility emergency response capabilities and potential. It is important that everyone understands both our capabilities and our limitations. Sharing lessons learned and best practices would allow for continuity in response and recovery.

3.   Formalized Roles

Formal roles must be written into policy or procedures enhancing the City of Mesa's utilities and interconnected sector's response structure. Integrating these policies and procedures into the National Incident Management System will provide coordination of efforts with outside sectors and agencies. It was obvious from the thematic analysis that participants did not understand where they "plugged" into the system. The City of Mesa should include outside sectors in joint planning to address expectations and accountability during response actions. Through training and exercises these roles will be reinforced. Employees should be strongly encouraged to participate in first responder training. This training should include all the stakeholders. The return on investment will be considerable for the organization.

4.   Measuring Success

The City of Mesa has no mechanisms for measuring the success of these recommendations. However, resiliency ensures the organization obtains the capabilities to continue providing services at any time, regardless of condition and impact. A system

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[180] Sharon Caudle, "Basic Practices Aiding High-Performance Homeland Security Regional Partnerships." *Homeland Security Affairs* II, no. 3 (October 2006): 8. http://wwwhsaj.org?article=2.3.7 [Accessed November 1, 2006].

based on resiliency helps prioritize investments in people (training), processes (redundancies), technology (current or upgrades), and facilities based on differing types of events, business risk and criticality. As Mesa's capacity to collaborate increases, so would the resiliency of essential services. In the end, cross-sector collaboration will increase the resiliency of Mesa's infrastructure and the interdependent sectors. Together, Mesa and our partners can address these system problems and expedite the response/recovery efforts and hardening of critical assets.

F.   CONCLUSION

Data reported in this research were gathered based on the diagnostic process developed by Thomas, Hocevar and Jansen.[181] The methodology consisted of 13 mid-level managers and 10 top manager interviews, the Collaborative Capacity survey and feedback on the survey results. Based on the findings of this study, the *Collaborative Capacity* model adequately "captured" the barriers and enablers. The participants identified several of the factors (Figure 6) in the model, but other factors were not mentioned. For example, in the dimension of "People," the participants did not mention anything regarding the organizations having a sense of commitment and motivation to find joint decisions. This could be reflective of the overall experience with collaboration. The City of Mesa utilities and interdependent sectors do not have a history of collaborating and would not be able to associate with the factor of "motivation," compared to an organization where collaboration is part of the business practice.

Overall, the model dimensions and sub-dimensions provide an adequate framework for categorizing the survey findings and initiating dialogue. In the case of the City of Mesa and interdependent sectors, the process served as an intervention to start the individual sectors talking about collaboration. Involving participants in the interpretation of the results and initiating a feedback loop provided a mechanism for learning. Involving the participants also provides ownership into the recommendations and future planning. However, it would have been beneficial to conduct this research in a focus group. This

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[181] Thomas, Hocevar, and Jansen, *A Diagnostic Approach to Building Collaborative Capacity in an Interagency Context.*

would have provided greater breadth to the results and findings of this research. It would be recommended to follow up this research with a focus group to build upon these data and continue the momentum for change.

The author recommends that future research assess the level of impact that this model generated from its initial use. Did the capacity of the organization increase? What factors were impacted by the implementation of recommendations? Encouraging collaboration should not wane but continue to be evaluated by the utility sectors.

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APPENDIX A: PARTICIPATORY EMAIL-SENIOR MANAGERS

Hello,

My name is Brian Draper, a student at the Naval Postgraduate School in Monterey. I am currently enrolled in the Masters Program and have started working on my thesis. My research centers around a diagnostic instrument designed to measure an organization's capacity to collaborative. As you are aware, the cornerstone of Federal Strategies for Critical Infrastructure Protection is collaboration. However, there is no means to assess whether these organizations have the capacity to achieve the strategic objectives. I look to use the City of Mesa and interdependent sectors as a case study to help validate this instrument. Mr. Plumb, the Utility Manager, has endorsed and extended his support for this research.

I request your participation in this research. This research will involve three separate phases of data collection. The first will involve obtaining your perceptions to the following questions. I assure you that your identity and responses will remain anonymous. If it is determined that your response would add to the thesis, I will contact you and we can ensure that you are comfortable with the material that will be used. The second phase will involve the completion of a survey. Finally, I will seek to obtain your feedback to the survey results.

Below are six questions that I ask you to consider and answer. Thanks in advance for your prompt assistance. In spite of any electronic submissions, a follow up interview may be required to clarify certain aspects of your response. Face-to-face or phone interviews can be scheduled in advance of responding to this email and would facilitate the data collection process.

1. What is the central (initiating) problem or opportunity that motivates interagency collaboration?

2. How does this problem or opportunity create a need to collaborate?

3. What type of collaboration occurs at your level of the organization?

4. Who are the critical stakeholders and what are their stakes in this context?

5. What degree of collaboration would be required for cross-sector partnerships?

6. What are the primary values or beneficial outcomes to be gained by collaboration?

Feel free to add examples or additional comments that expand beyond the barriers of these questions. Thanks.

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APPENDIX B: PARTICIPATORY EMAIL-MIDDLE MANAGERS

Hello,

My name is Brian Draper, a student at the Naval Postgraduate School in Monterey. I am currently enrolled in the Masters Program and have started working on my thesis. My research centers around a diagnostic instrument designed to measure an organization's capacity to collaborative. As you are aware, the cornerstone of Federal Strategies for Critical Infrastructure Protection is collaboration. However, there is no means to assess whether these organizations have the capacity to achieve the strategic objectives. I look to use the City of Mesa and interdependent sectors as a case study to help validate this instrument. Mr. Plumb, the Utility Manager, has provided his endorsement and extended his support for this research

I request that you agree to participate in this research. This research will involve three separate phases of data collection. The first will involve obtaining your perceptions to the following questions. I assure you that the identity and responses will remain anonymous. If it is determined that your response would add to the thesis, I will contact you and we can ensure that you are comfortable with the material that will be used. The choice will be entirely up to the participant. The second phase will involve the completion of a survey. Finally, I will seek to obtain your feedback to the survey results.

Below are six questions that I ask you to consider and answer. At this initial phase of my research, the data you provide here will be useful for selecting survey questions. Thanks in advance for your prompt assistance. In spite of any electronic submissions, a follow up interview may be required to clarify certain aspects of your response. Face-to-face or phone interviews can be scheduled in advance of responding to this email and would facilitate the data collection process.

1. What is the central (initiating) problem or opportunity that motivates interagency collaboration?

2. How does this problem or opportunity create a need to collaborate?

3. What type of collaboration occurs at your level of the organization?

4. What degree of collaboration is required or allowed?

5. Is there consensus as to the nature of the problem?

6. How does the value of collaboration vary between the different partners?

Feel free to add examples or additional comments that expand beyond the barriers of these questions. Thanks again

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APPENDIX C: COLLABORATIVE CAPACITY AUDIT

Question	Strongly Disagree	Disagree	Agree	Strongly Agree
1. Our organizational leaders often meet and confer with the leaders of other agencies about cross-sector collaboration.	☐	☐	☐	☐
2. Cross-sector (e.g., water, electric, and gas) collaboration is a high priority for my organization.	☐	☐	☐	☐
3. Because of my organization's unique requirements, I find it difficult to engage in cross-sector collaboration.	☐	☐	☐	☐
4. My organization recognizes the importance of working with other sectors to achieve an outcome.	☐	☐	☐	☐
5. My organization is willing to adapt procedures to meet the requirements of outside organizations with which we might work.	☐	☐	☐	☐
6. Conflicting organizational policies make collaboration very difficult for my organization.	☐	☐	☐	☐
7. My organization lacks formal roles that support effective cross-sector collaboration.	☐	☐	☐	☐
8. Effective cross-divisional collaboration occurs within my organization.	☐	☐	☐	☐
9. My organization has strong norms that encourage cross-sector collaboration.	☐	☐	☐	☐
10. My organization has strong norms for learning from others.	☐	☐	☐	☐
11. My organization invests time and resources to become familiar with the capabilities and requirements of the organizations with which we might work.	☐	☐	☐	☐
12. My organization is responsive to the requirements of other organizations with which we work.	☐	☐	☐	☐
13. My organizational processes are too rigid and don't enable me to work effectively with other organizations.	☐	☐	☐	☐
14. My organization provides adequate access by other sectors to information we have that is relevant to their work.	☐	☐	☐	☐
15. My leadership commits their time and our resources to combined training with other sectors.	☐	☐	☐	☐
16. Employees who work with other sectors know whom to contact in those agencies for information or decisions.	☐	☐	☐	☐
17. My organization works with other sectors or	☐	☐	☐	☐

agencies to identify lessons learned for improved collaboration.				
18. In my organization, people take the initiative to build relationships with other organizations.	☐	☐	☐	☐
19. My organization has the technical interoperability to enable effective cross-sector collaboration.	☐	☐	☐	☐
20. My organization captures lessons learned to increase our collaboration skills.	☐	☐	☐	☐
21. A history of competition and conflict affects our cross-sector capability.	☐	☐	☐	☐
22. My organization has a history of working well with other sectors.	☐	☐	☐	☐
23. We gain savings in training costs by collaborating with other agencies.	☐	☐	☐	☐
24. Potential collaborative partners often view my organization as competitors.	☐	☐	☐	☐
25. I have adequate time to invest in the requirements for collaboration.	☐	☐	☐	☐
26. My organization has a history of cross-sector competition.	☐	☐	☐	☐
27. People in my organization have no energy for collaborating with those in other organizations.	☐	☐	☐	☐
28. People in my organization recognize the importance of working with other sectors to achieve an outcome.	☐	☐	☐	☐
29. Members of my organization are aware of the capabilities of other organizations with which we work.	☐	☐	☐	☐
30. People in my organization have a positive attitude toward collaboration with other organizations.	☐	☐	☐	☐
31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.	☐	☐	☐	☐
32. Members of my organization respect the expertise of those in other organizations with whom we have to work.	☐	☐	☐	☐
33. When working on cross-sector issues, I often face incompatible requirements or requests.	☐	☐	☐	☐
34. Employees from my organization are not used to working with people from other organizations and find it hard to do so.	☐	☐	☐	☐
35. People in my organization tend to be suspicious and distrustful of counterparts in other organizations.	☐	☐	☐	☐
36. Upper Management or Middle Management (Supervisory)	**Upper**		**Middle**	
	☐		☐	

APPENDIX D: COLLABORATIVE CAPACITY AUDIT RESULTS

COMBINED SENIOR AND MIDDLE MANAGERS (N=23)

Question	Disagree	Agree	Mean
1. Our organizational leaders often meet and confer with the leaders of other agencies about cross-sector collaboration.	61%	39%	2.3
2. Cross-sector (e.g., water, electric, and gas) collaboration is a high priority for my organization.	74%	26%	2.2
3. Because of my organization's unique requirements, I find it difficult to engage in cross-sector collaboration.	61%	39%	2.3
4. My organization recognizes the importance of working with other sectors to achieve an outcome.	22%	78%	2.9
5. My organization is willing to adapt procedures to meet the requirements of outside organizations with which we might work.	52%	48%	2.5
6. Conflicting organizational policies make collaboration very difficult for my organization.	43%	57%	2.6
7. My organization lacks formal roles that support effective cross-sector collaboration.	26%	74%	2.9
8. Effective cross-divisional collaboration occurs within my organization.	57%	43%	2.4
9. My organization has strong norms that encourage cross-sector collaboration.	78%	22%	2.1
10. My organization has strong norms for learning from others.	70%	30%	2.2
11. My organization invests time and resources to become familiar with the capabilities and requirements of the organizations with which we might work.	74%	26%	2.0
12. My organization is responsive to the requirements of other organizations with which we work.	35%	65%	2.6
13. My organizational processes are too rigid and don't enable me to work effectively with other organizations.	74%	26%	2.2
14. My organization provides adequate access by other sectors to information we have that is relevant to their work.	39%	61%	2.5
15. My leadership commits their time and our resources to combined training with other sectors.	74%	26%	2.0
16. Employees who work with other sectors know whom to contact in those agencies for information or decisions.	26%	74%	2.7
17. My organization works with other sectors or agencies to identify lessons learned for improved collaboration.	70%	30%	2.2
18. In my organization, people take the initiative to build relationships with other organizations.	49%	51%	2.5

19. My organization has the technical interoperability to enable effective cross-sector collaboration.	**17%**	**83%**	**3.2**
20. My organization captures lessons learned to increase our collaboration skills.	**57%**	**43%**	**2.4**
21. A history of competition and conflict affects our cross-sector capability.	**22%**	**78%**	**3.0**
22. My organization has a history of working well with other sectors.	**49%**	**51%**	**2.6**
23. We gain savings in training costs by collaborating with other agencies.	**35%**	**65%**	**2.8**
24. Potential collaborative partners often view my organization as competitors.	**61%**	**39%**	**2.4**
25. I have adequate time to invest in the requirements for collaboration.	**61%**	**39%**	**2.3**
26. My organization has a history of cross-sector competition.	**43%**	**57%**	**2.6**
27. People in my organization have no energy for collaborating with those in other organizations.	**70%**	**30%**	**2.3**
28. People in my organization recognize the importance of working with other sectors to achieve an outcome.	**9%**	**91%**	**3.0**
29. Members of my organization are aware of the capabilities of other organizations with which we work.	**35%**	**65%**	**2.7**
30. People in my organization have a positive attitude toward collaboration with other organizations.	**52%**	**48%**	**2.4**
31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.	**57%**	**43%**	**2.3**
32. Members of my organization respect the expertise of those in other organizations with whom we have to work.	**17%**	**83%**	**2.8**
33. When working on cross-sector issues, I often face incompatible requirements or requests.	**52%**	**48%**	**2.5**
34. Employees from my organization are not used to working with people from other organizations and find it hard to do so.	**57%**	**43%**	**2.4**
35. People in my organization tend to be suspicious and distrustful of counterparts in other organizations.	**57%**	**43%**	**2.4**

MIDDLE MANAGERS (N=13)

Question	Disagree	Agree	Mean
1. Our organizational leaders often meet and confer with the leaders of other agencies about cross-sector collaboration.	46%	54%	2.5
2. Cross-sector (e.g., water, electric, and gas) collaboration is a high priority for my organization.	54%	46%	2.5
3. Because of my organization's unique requirements, I find it difficult to engage in cross-sector collaboration.	85%	15%	2.0
4. My organization recognizes the importance of working with other sectors to achieve an outcome.	31%	69%	2.8
5. My organization is willing to adapt procedures to meet the requirements of outside organizations with which we might work.	38%	62%	2.6
6. Conflicting organizational policies make collaboration very difficult for my organization.	46%	54%	2.5
7. My organization lacks formal roles that support effective cross-sector collaboration.	38%	62%	2.6
8. Effective cross-divisional collaboration occurs within my organization.	46%	54%	2.5
9. My organization has strong norms that encourage cross-sector collaboration.	69%	31%	2.3
10. My organization has strong norms for learning from others.	77%	23%	2.2
11. My organization invests time and resources to become familiar with the capabilities and requirements of the organizations with which we might work.	69%	31%	2.3
12. My organization is responsive to the requirements of other organizations with which we work.	15%	85%	2.9
13. My organizational processes are too rigid and don't enable me to work effectively with other organizations.	92%	8%	1.9
14. My organization provides adequate access by other sectors to information we have that is relevant to their work.	23%	77%	2.7
15. My leadership commits their time and our resources to combined training with other sectors.	61%	39%	2.3
16. Employees who work with other sectors know whom to contact in those agencies for information or decisions.	38%	62%	2.6
17. My organization works with other sectors or agencies to identify lessons learned for improved collaboration.	69%	31%	2.2
18. In my organization, people take the initiative to build relationships with other organizations.	46%	54%	2.5

19. My organization has the technical interoperability to enable effective cross-sector collaboration.	**8%**	**92%**	**3.3**
20. My organization captures lessons learned to increase our collaboration skills.	**54%**	**46%**	**2.5**
21. A history of competition and conflict affects our cross-sector capability.	**31%**	**69%**	**2.9**
22. My organization has a history of working well with other sectors.	**38%**	**61%**	**2.8**
23. We gain savings in training costs by collaborating with other agencies.	**46%**	**54%**	**2.6**
24. Potential collaborative partners often view my organization as competitors.	**69%**	**31%**	**2.2**
25. I have adequate time to invest in the requirements for collaboration.	**54%**	**46%**	**2.4**
26. My organization has a history of cross-sector competition.	**53%**	**46%**	**2.5**
27. People in my organization have no energy for collaborating with those in other organizations.	**92%**	**8%**	**1.9**
28. People in my organization recognize the importance of working with other sectors to achieve an outcome.	**15%**	**85%**	**2.9**
29. Members of my organization are aware of the capabilities of other organizations with which we work.	**23%**	**77%**	**2.8**
30. People in my organization have a positive attitude toward collaboration with other organizations.	**54%**	**46%**	**2.5**
31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.	**46%**	**54%**	**2.5**
32. Members of my organization respect the expertise of those in other organizations with whom we have to work.	**23%**	**77%**	**2.8**
33. When working on cross-sector issues, I often face incompatible requirements or requests.	**69%**	**31%**	**2.4**
34. Employees from my organization are not used to working with people from other organizations and find it hard to do so.	**85%**	**15%**	**2.1**
35. People in my organization tend to be suspicious and distrustful of counterparts in other organizations.	**77%**	**23%**	**2.2**

SENIOR MANAGERS (n=10)

Question	Disagree	Agree	Mean
1. Our organizational leaders often meet and confer with the leaders of other agencies about cross-sector collaboration.	80%	20%	2.0
2. Cross-sector (e.g., water, electric, and gas) collaboration is a high priority for my organization.	100%	0	1.8
3. Because of my organization's unique requirements, I find it difficult to engage in cross-sector collaboration.	30%	70%	2.7
4. My organization recognizes the importance of working with other sectors to achieve an outcome.	10%	90%	3.0
5. My organization is willing to adapt procedures to meet the requirements of outside organizations with which we might work.	70%	30%	2.2
6. Conflicting organizational policies make collaboration very difficult for my organization.	40%	60%	2.7
7. My organization lacks formal roles that support effective cross-sector collaboration.	10%	90%	3.3
8. Effective cross-divisional collaboration occurs within my organization.	70%	30%	2.1
9. My organization has strong norms that encourage cross-sector collaboration.	90%	10%	1.9
10. My organization has strong norms for learning from others.	60%	40%	2.1
11. My organization invests time and resources to become familiar with the capabilities and requirements of the organizations with which we might work.	80%	20%	1.6
12. My organization is responsive to the requirements of other organizations with which we work.	60%	40%	2.2
13. My organizational processes are too rigid and don't enable me to work effectively with other organizations.	50%	50%	2.7
14. My organization provides adequate access by other sectors to information we have that is relevant to their work.	60%	40%	2.2
15. My leadership commits their time and our resources to combined training with other sectors.	90%	10%	1.7
16. Employees who work with other sectors know whom to contact in those agencies for information or decisions.	10%	90%	2.8
17. My organization works with other sectors or agencies to identify lessons learned for improved collaboration.	70%	30%	2.0
18. In my organization, people take the initiative to build relationships with other organizations.	50%	50%	2.4
19. My organization has the technical interoperability to enable effective cross-sector collaboration.	30%	70%	3.1

20. My organization captures lessons learned to increase our collaboration skills.	**60%**	**40%**	**2.4**
21. A history of competition and conflict affects our cross-sector capability.	**10%**	**90%**	**3.1**
22. My organization has a history of working well with other sectors.	**60%**	**40%**	**2.4**
23. We gain savings in training costs by collaborating with other agencies.	**20%**	**80%**	**3.0**
24. Potential collaborative partners often view my organization as competitors.	**50%**	**50%**	**2.7**
25. I have adequate time to invest in the requirements for collaboration.	**70%**	**30%**	**2.1**
26. My organization has a history of cross-sector competition.	**30%**	**70%**	**2.7**
27. People in my organization have no energy for collaborating with those in other organizations.	**40%**	**60%**	**2.8**
28. People in my organization recognize the importance of working with other sectors to achieve an outcome.	**0%**	**100%**	**3.2**
29. Members of my organization are aware of the capabilities of other organizations with which we work.	**50%**	**50%**	**2.4**
30. People in my organization have a positive attitude toward collaboration with other organizations.	**50%**	**50%**	**2.3**
31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.	**70%**	**30%**	**2.0**
32. Members of my organization respect the expertise of those in other organizations with whom we have to work.	**10%**	**90%**	**3.0**
33. When working on cross-sector issues, I often face incompatible requirements or requests.	**30%**	**70%**	**2.6**
34. Employees from my organization are not used to working with people from other organizations and find it hard to do so.	**20%**	**80%**	**2.9**
35. People in my organization tend to be suspicious and distrustful of counterparts in other organizations.	**30%**	**70%**	**2.8**

APPENDIX E: INTERPRETATION/RECOMMENDATION FORM

Finding #1: Importance of collaboration

90% of Senior Managers "Agree" with the importance of working with other sectors (Q4)

BUT

Senior managers unanimously (100%) "Disagree" that collaboration is a high priority for the organization (Q2), Why are the % response to these 2 questions so different?

How would you interpret this finding? What do you think it means, in the context of cross-sector collaboration?

What recommendations would you make to address this?

Finding #2: Barriers to Collaboration

Q.34. *Employees are not used to working with people from other organizations and find it difficult to do so.*

 Senior Managers: 80% agree

 Middle Managers: 15% agree

Q.35. *People in my organization tend to be suspicious and distrustful of counterparts in other organizations.*

 Senior Managers: 70% agree

 Middle managers: 23% agree

How would you interpret this finding? What are the implications?

What recommendations would you make to address this?

Finding #3: Expertise and shared decision making.

Q.32. Members of my organization respect the expertise of those in other organizations with whom we have to work.

     83% agree (middle and senior managers)

Q.31. Members of my organization are willing to share decision-making authority with other organizations when addressing cross-sector issues.

     43% agree (middle and senior managers)

     30% agree (senior managers)

How would you interpret this finding? What are the implications?

What recommendations would you make to address this?

Finding #4: Training

Q.23. We gain savings in training costs by collaborating with other agencies.

   65% agree (middle and senior managers)

Q.15. My leadership commits their time and our resources to combined training with other sectors.

   26% agree (middle and senior managers)

How would you interpret this finding? What are the implications?

What recommendations would you make to address this?

Finding #5: Divergent Goals

Q.3. Because of my organization's unique requirements, I find it difficult to engage in cross-sector collaboration.

> *Senior managers: 70% agree*

> *Middle managers: 15% agree*

However, 85% of middle managers "Disagreed" that this had an impact on collaboration.

How would you interpret this finding? What are the implications?

What recommendations would you make to address this?

Finding #6: "Reader's choice"

<u>I am interested in any other survey result that you find particularly noteworthy. Please identify the question and then use the boxes below to give your interpretation and recommendations.</u>

How would you interpret this finding? What are the implications?

What recommendations would you make to address this?

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